TBarCode

Barcode Generator Components

Version 11

User Manual

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Content

1 Content

1 Content 2
1.1 List of Figures 5
1.2 List of Tables 6

2 Disclaimer 7

3 Introduction 8
3.1 What is TBarCode SDK? 8
3.2 Scope of this Document 8
3.3 What is TBarCode OCX? 8
3.4 Restrictions of the Demo Version 9
3.5 Important Security Notice 9

4 Installation 10
4.1 Requirements 10
4.2 Download and Setup 10

5 Insert Barcode into Microsoft Office 11
5.1 General 11
5.2 Microsoft Office 2003 11
5.2.1 Insert Barcode in Word 2003 using the Menu 11
5.2.2 Insert Barcode in Word 2003 using the Control Toolbox 12
5.3 Microsoft Office 2007 12
5.3.1 Insert Barcode in Word 2007 12
5.3.2 Insert Barcode in Excel 2007 13
5.3.3 Insert Barcode in Access 2007 14
5.4 Microsoft Office 2010 / Office 2013 15
5.4.1 Insert Barcode in Word 2010 / Word 2013 15
5.4.2 Insert Barcode in Excel 2010 / Excel 2013 16
5.4.3 Insert Barcode in Access 2010 / Access 2013 17
5.5 Insert Barcode per Code 18

6 Adjust Barcode Parameters 19
6.1 General 19
6.2 Activate the Design Mode 19
6.2.1 Microsoft Word or Excel 19
6.2.2 Microsoft Access 19
6.3 Barcode Parameters 20
6.3.1 Property Pages 20
6.3.2 Property List 21
6.3.3 Adjust Parameters per Code 21

7 Set Barcode Data (Data Binding) 22
7.1 General 22
7.2 Specify Data Manually 22
7.2.1 Property Pages 22
7.2.2 Property List 22
7.3 Data Binding 22
7.3.1 Microsoft Excel 22
7.3.2 Microsoft Access 23
7.3.3 Specify Data via VBA Code 24

8 Programming TBarCode (VBA) 25
8.1 General 25
8.2 Microsoft Office and VBA 25
8.3 Insert Barcode 25
8.3.1 Microsoft Word 26
8.3.2 Microsoft Excel 26
8.4 Adjust Barcode Parameters and Barcode Data 27
8.4.1 Microsoft Word or Excel 27
8.4.2 Microsoft Access 27
8.5 License TBarCode 27

9 Barcodes in Microsoft InfoPath® 28
9.1 General 28
9.2 InfoPath 2003 28
9.2.1 Activate the Design Mode 28
9.2.2 Add TBarCode to the Custom Controls 28
9.2.2.1 Specify Data Source Type 30
9.2.2.2 Finish Adding the Custom Control 32
9.2.3 Insert Barcode 33
9.2.4 Change Binding 33

9.2.5 Adjust Barcode Parameters 34
9.3 InfoPath 2010 / InfoPath 2013 34
9.3.1 Add TBarCode to the Custom Controls 35
9.3.1.1 Specify Data Source Type 36
9.3.1.2 Finish Adding the Custom Control 38
9.3.2 Insert Barcode 39
9.3.3 Change Binding 39
9.3.4 Adjust Barcode Parameters 40

10 The Property Pages 41
10.1 Introduction 41
10.2 Property Page “Barcode” 41
10.2.1 Barcode Type (Symbology) 41
10.2.2 Button “Adjust…” 41
10.2.3 Barcode Data 42
10.2.4 Encoding Mode 42
10.2.5 Code page 42
10.2.6 Format/Subset 42
10.2.7 Check Digit 43
10.2.7.1 Check Digit Override 43
10.2.8 Compression 43
10.2.9 Suppress Error Messages 44
10.2.10 Translate Escape Sequences 44
10.2.11 Button “License…” 44
10.2.12 Button “About…” 44
10.3 Property Page “Appearance” 45
10.3.1 General 45
10.3.1.1 Orientation 45
10.3.1.2 Print Ratio 45
10.3.1.3 Back Style 45
10.3.1.4 Bar Width Reduction [%] 46
10.3.1.5 Bearer Bars 46
10.3.1.6 Bearer Bar Width [1/1000 mm] 46
10.3.1.7 Draw Mode 46
10.3.1.8 Quiet Zone 47
10.3.2 Text Options 47
10.3.2.1 Print Text 47
10.3.2.2 Above Symbol 47
10.3.2.3 Alignment 48
10.3.2.4 Text Distance 48
10.3.3 Barcode Size and Module Width 48
10.3.3.1 Mode 48
10.3.3.2 Module Width [1/1000 mm] 48
10.3.3.3 Resolution 49
10.3.3.4 Custom Resolution (DPI) 49
10.3.3.5 Decoder 49
10.3.4 Display Error if Barcode is clipped 50
10.4 Property Page “Font” 50
10.4.1 Properties 50
10.4.2 Font 50
10.4.3 Size 50
10.4.4 Effects 50
10.4.5 Sample Text 51
10.5 Property Page “Color” 51
10.5.1 Properties 51
10.5.2 Color Set 52
10.5.3 Color Palette 52
10.5.4 Edit Custom Color… 52
10.6 Adjust… 52
10.7 Adjust Properties: Aztec Code 53
10.7.1 Format / Format Specifier 53
10.7.2 Symbol Size 53
10.7.3 Enforce binary encoding 53
10.7.4 Enable Aztec Runes 53
10.7.5 Error Correction in % [0-90] 54
10.7.6 Structured Append 54
10.7.6.1 Use structured append 54
10.7.6.2 Number of all symbols [A…Z] 54
10.7.6.3 Index of this symbol [1…16] 54
10.7.6.4 Message ID 54
10.8 Adjust Properties: Codablock-F 54
10.8.1 Rows [2..44] 54
10.8.2 Columns [4..62] 54
10.8.3 Row height [1/1000 mm] 55

10.8.4 Separator height [1/1000 mm] 55
10.8.5 Code format 55
10.9 Adjust Properties: Data Matrix 55
10.9.1 Code Format 55
10.9.2 Symbol Size 56
10.9.3 Enforce Binary Encoding 56
10.9.4 Show as Rectangle 56
10.9.5 Structured Append 56
10.9.5.1 Use structured append 56
10.9.5.2 Number of all symbols [2…16] 56
10.9.5.3 Index of this symbol [1…16] 56
10.9.5.4 File-ID [1…64516] 56
10.10 Adjust Properties: DotCode 56
10.10.1 Format / Format Specifier 57
10.10.2 Size Mode 57
10.10.3 Ratio/Size 57
10.10.4 Print Direction 57
10.10.5 Enforce Binary Encoding 57
10.10.6 Mask 58
10.10.7 Structured Append 58
10.10.7.1 Use Structured Append 58
10.10.7.2 Number of all Symbols [2…35] 58
10.10.7.3 Index of this Symbol [1…35] 58
10.11 Adjust Properties: Han Xin Code 58
10.11.1 Symbol Version (Size) 58
10.11.2 Enforce Binary Encoding 58
10.11.3 Error Correction Level 59
10.11.4 Mask Pattern 59
10.12 Adjust Properties: MaxiCode 59
10.12.1 Mode 60
10.12.2 Undercut [0..100 %] 60
10.12.3 Preamble Options 60
10.12.3.1 Use Preamble 60
10.12.3.2 Preamble date (0…99) 60
10.12.4 Structured Append 60
10.12.4.1 Use structured append 60
10.12.4.2 Number of all symbols [2…8] 60
10.12.4.3 Index of this symbol [1…8] 60
10.12.5 Structured Carrier Message (SCM) 60
10.12.5.1 Service class [0...999] 61
10.12.5.2 Country code [0...999] 61
10.12.5.3 Postal code [9 digits] 61
10.13 Adjust Properties: PDF417 61
10.13.1 PDF417 61
10.13.1.1 Rows [3..90] 62
10.13.1.2 Row height [1/1000 mm] 62
10.13.1.3 Columns [1..30] 62
10.13.1.4 Error Correction Level 62
10.13.1.5 Encoding Mode 63
10.13.2 MicroPDF417 63
10.13.2.1 Mode 63
10.13.2.2 Version 63
10.13.3 Macro PDF417 (structured append) 63
10.14 Adjust Properties: QR-Code / QR-Code 2005 64
10.14.1 Format / Application Indicator 64
10.14.2 Symbol Version (Size) 64
10.14.3 Error Correction Level 65
10.14.4 Mask Pattern 65
10.14.5 Compaction 65
10.14.6 Structured Append 65
10.14.6.1 Use Structured Append 65
10.14.6.2 Parity Byte [0…255] 66
10.14.6.3 Number of all Symbols [2…16] 66
10.14.6.4 Index of this Symbol [1…16] 66
10.15 Adjust Properties: Micro QR-Code 66
10.15.1 Symbol Version (Size) 66
10.15.2 Error Correction Level 66
10.15.3 Mask Pattern 67
10.15.4 Compaction 67
10.16 Adjust Properties: Composite/GS1 DataBar (RSS) 67
10.16.1 Composite Component 67
10.16.1.1 Data Input for the GS1 Composite Symbology 68
10.16.2 Segments per Row 68

11 Licensing 69
11.1 License Types 69
11.2 Entering your License Data 69
11.2.1 License Dialog 69

12 Contact and Support Information 70

Appendix A : Related Downloads 71
A.1 Developer Manuals 71
A.2 Sample Applications 71
A.3 Barcode Reference 71

Appendix B : TBarCode INI-File 72
B.1 Compatible Draw Mode 72
B.2 Site Lock (OCX only) 72
B.3 License TBarCode 72

Appendix C : FAQ 73

1.1 List of Figures

Figure 1: Insert Barcode using the Menu (Microsoft Word) 11
Figure 2: Insert Barcode using the Control Toolbox (Microsoft Word) 12
Figure 3: Excel 2007: Excel Options - Show Developer tab 13
Figure 4: Excel 2007: More Controls 14
Figure 5: Excel 2007: Select TBarCode11 14
Figure 6: Excel 2010: Excel Options - Show Developer tab 16
Figure 7: Excel 2010: More Controls 17
Figure 8: Excel 2010: Select TBarCode11 17
Figure 9: Property Pages (Microsoft Word) 20
Figure 10: Property List (Microsoft Word) 21
Figure 11: Data Binding in Microsoft Excel 23
Figure 12: Data Binding in Microsoft Access 24
Figure 13: Add TBarCode to the Custom Controls in Microsoft InfoPath 2003 (1) 29
Figure 14: Add TBarCode to the Custom Controls in Microsoft InfoPath 2003 (2) 30
Figure 15: Add TBarCode to the Custom Controls in Microsoft InfoPath 2003 (3) 32
Figure 16: Insert TBarCode in a Microsoft InfoPath 2003 Document 33
Figure 17: Adjust Barcode Properties in Microsoft InfoPath 2003 34
Figure 18: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (1) 35
Figure 19: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (2) 35
Figure 20: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (3) 36
Figure 21: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (4) 38
Figure 22: Insert TBarCode in a Microsoft InfoPath 2010 Document 39
Figure 23: Adjust Barcode Properties in Microsoft InfoPath 2010 40
Figure 24: Property Page “Barcode” 41
Figure 25: Property Page “Appearance” 45
Figure 26: Quiet Zone Adjustment 47
Figure 27: Property Page “Font” 50
Figure 28: Property Page “Color” 51
Figure 29: Adjust… 52
Figure 30: Advanced Properties: Aztec Code 53
Figure 31: Advanced Properties: Codablock-F 54
Figure 32: Advanced Properties: Data Matrix 55
Figure 33: Advanced Properties: DotCode 57
Figure 34: Advanced Properties: Han Xin Code 58
Figure 35: Advanced Properties: MaxiCode 59
Figure 36: Advanced Properties: PDF417 61
Figure 37: Advanced Properties: QR-Code 64
Figure 38: Advanced Properties: Micro QR-Code 66
Figure 39: Advanced Properties: Composite/GS1 DataBar 67

1.2 List of Tables

Table 1: Compression 42
Table 2: Compression 44
Table 3: Bearer Bars 46
Table 4: Draw Mode 46
Table 5: Text Alignment 48
Table 6: Size Mode 48
Table 7: Resolution 49
Table 8: Decoder 49
Table 9: Codablock-F Code Formats 55
Table 10: Data Matrix Code Formats 56
Table 11: DotCode Formats 57
Table 12: DotCode Mask Patterns 58
Table 13: Han Xin Code Error Correction Levels 59
Table 14: Han Xin Code Mask Patterns 59
Table 15: MaxiCode Compaction Modes 60
Table 16: PDF417 Error Correction Levels 62
Table 17: Micro PDF417 Compaction Modes 63
Table 18: QR-Code Formats 64
Table 19: QR-Code Error Correction Levels 65
Table 20: QR-Code Mask Patterns 65
Table 21: QR-Code Compaction Modes 65
Table 22: Composite Component Format 67

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3 Introduction

3.1 What is TBarCode SDK?

TBarCode SDK is a set of professional tools for the generation of barcodes. More than 100 different symbologies (linear barcodes, 2D barcodes and stacked barcode variants) can be printed or exported as graphics files. All industry formats are supported. The barcodes can be generated in the highest possible resolution and quality.

TBarCode SDK is available in several versions for different operating systems, applications and programming environments. The following versions are included in this setup:

TBarCode OCX	A Microsoft® ActiveX® compliant barcode control. It can be used with Microsoft® Office applications as well as by software developers.
TBarCode .NET	A .NET barcode library for software developers. It includes barcode controls for Windows Forms and ASP.NET 2.0.
TBarCode Library	A DLL for Windows platforms for software developers. (A DLL for Windows CE/Windows Mobile is available on request. Please contact us with your platform details.)

3.2 Scope of this Document

This document concentrates on the use of **TBarCode OCX** in Microsoft Office applications.

In contrast to the other two components **(TBarCode .NET, TBarCode Library) TBarCode OCX** may be used without any programming knowledge. This makes it easy to use and you will get results in quasi no time. Using the OCX control you can integrate bar codes in text documents, spreadsheets and the like. First insert the barcode object in the desired document. Then adjust the barcode properties (barcode type, data, etc.) in the provided dialogs.

The first part of the document explains how to use **TBarCode OCX** in Office Applications like Word, Excel, Access and InfoPath. A few simple examples also demonstrate the possibility of programming the control in Visual Basic for Applications.

The second part of this document describes all available barcode properties, which can be adjusted in the property dialogs. All of these parameters are described in detail.

If you are a software developer and if you are interested in integrating barcode features into your own applications please check out the accompanying developer manuals, developer references and sample applications (see Appendix A).

3.3 What is TBarCode OCX?

TBarCode OCX is a Microsoft® ActiveX® compliant barcode control. Such an ActiveX control is sometimes called OLE control or OCX control. In German it is named "Steuerelement".

You can use **TBarCode OCX** in:

- Microsoft® Office: barcodes are embedded into documents, forms or databases easily.
- Development environments: integrate barcodes into your own application(s).
- Report-Generators and Reporting Engines: Enhance the output with barcode functionality.
- Web Applications: Use barcode technique as part of browser-based applications.

- Most programming and script languages.

Examples[1], where you can use **TBarCode OCX** for barcode generation:

- Microsoft Word
- Microsoft Excel®
- Microsoft Access®
- Microsoft InfoPath®
- Microsoft SharePoint®
- Microsoft Visio®
- Microsoft Visual Basic®
- Microsoft Visual C++®
- Microsoft ASP (VBScript®)
- Microsoft Internet Explorer®
- Microsoft Visual FoxPro®
- Microsoft Dynamics Nav®
- Navision Financials®
- PHP 4.x, PHP 5.x
- Borland C++ Builder®
- Borland Delphi®
- Borland Quick Reports®
- Sybase® PowerBuilder
- Crystal Reports® 8
- ActiveReports (Data Dynamics)
- IBM® Object REXX®
- Alpha Five Database (XBasic)
- ASNA Visual RPG®
- And a lot of more applications…

3.4 Restrictions of the Demo Version

In the demo version the barcodes will be drawn with a demo-hint. That means that the word “Demo” or the phrase “www.tec-it.com” is drawn partially over the barcode. The demo-hint does not influence the readability of the barcode in a negative way.

- In special cases (e.g. very small or high-resolution barcodes) you may want to test the product without restrictions. To obtain a temporary license key contact sales@tec-it.com.
- For enabling the full-featured version (without the demo hints) you can obtain a license key from TEC-IT (http://www.tec-it.com/order/).
- For more information on licensing **TBarCode,** please refer to chapter 11.

3.5 Important Security Notice

- Version 8.0 and newer versions include a fix which was implemented in response to a security leak (a malicious web-site in conjunction with Internet Explorer and an installed **TBarCode** ActiveX). Up to now no real threat is known, but it is strongly recommended to update all TBarCode installations as soon as possible.

[1] For applications not supporting ActiveX technology you may use other TEC-IT Barcode Tools (e.g. Barcode Studio).

4 Installation

4.1 Requirements

The following operating systems are supported:

- Microsoft Windows XP
- Microsoft Windows Server 2003
- Microsoft Windows Vista
- Microsoft Windows Server 2008
- Microsoft Windows 7
- Microsoft Windows 8
- Microsoft Windows Server 2012

TBarCode OCX was tested with the following Microsoft Office versions (in particular with Microsoft Word, Excel, Access, Visio and InfoPath):

- Microsoft Office 2003
- Microsoft Office 2007
- Microsoft Office 2010 (32-bit and 64-bit)
- Microsoft Office 2012 (32-bit and 64-bit)

4.2 Download and Setup

Download **TBarCode SDK** from http://www.tec-it.com/Download ► *TBarCode SDK* and execute the setup application. Depending on your selection one or more of the following components are installed – along with documentations and sample applications:

- **TBarCode OCX**
  A barcode ActiveX control for Microsoft Office users and for software developers. User manual and API reference are included in the setup.
- **TBarCode Library**
  For software developers. Developer manual and API reference are included in the setup.
- **TBarCode .NET**
  For .NET developers. Developer manual and API reference are included in the setup.

► Administrative rights are required to install **TBarCode SDK**.

► **TBarCode OCX** is an ActiveX control. ActiveX controls must be registered within the Microsoft Windows operating system before they can be used. This registration is executed automatically by the setup application. On demand you can register the OCX file manually with the command line tool *"regsvr32.exe"*.

5 Insert Barcode into Microsoft Office

5.1 General

This and the following chapters will explain how to use **TBarCode** in Microsoft Office applications. For the following three products the usage of the **TBarCode** control is basically the same (see **TBarCode** *QuickStart* manual):

- Microsoft Word 2003 (and earlier versions)
- Microsoft Excel 2003 (and earlier versions)
- Microsoft Access 2003 (and earlier versions)

In Office 2007 / Office 2010 / Office 2013 inserting the **TBarCode** control has slightly changed. How to do this is explained in the sections 5.3, 5.4:

- Insert Barcode in Microsoft Word 2007/2010
- Insert Barcode in Microsoft Excel 2007/2010
- Insert Barcode in Microsoft Access 2007/2010

Finally, the usage of **TBarCode** in Microsoft InfoPath is explained in chapter 9.

5.2 Microsoft Office 2003

5.2.1 Insert Barcode in Word 2003 using the Menu

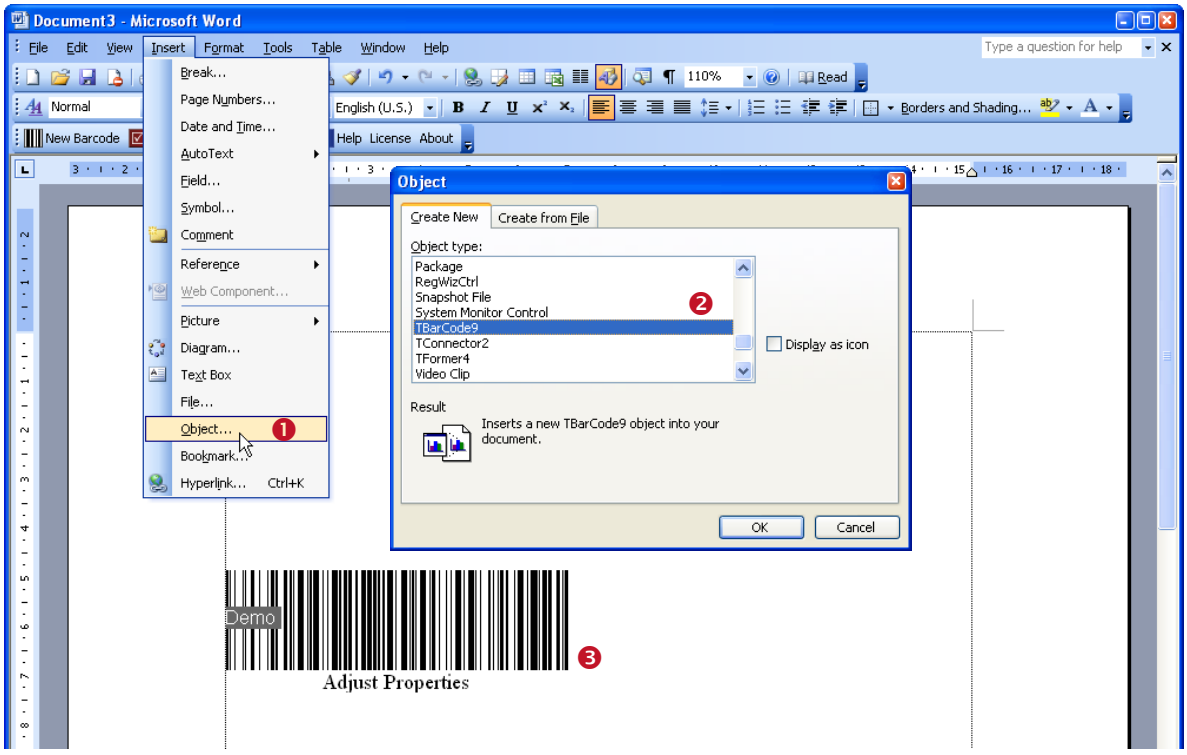


Figure 1: Insert Barcode using the Menu (Microsoft Word)

Application	How to insert
Word	▪ Select *Insert* ► *Object…* from the menu (❶).

Excel	▪ Select *TBarCode11* from the list of object types ❷ and confirm with *OK*. ▪ A new barcode object will be inserted (❸).
Access	▪ Open your report (or form) in the design mode (see 6.2). ▪ Select *Insert* ► *ActiveX Control…* from the menu. ▪ Select *TBarCode11* from the list of object types and confirm with *OK*. ▪ A new barcode object will be inserted.
InfoPath	Please refer to section 9.2.3.

5.2.2 Insert Barcode in Word 2003 using the Control Toolbox

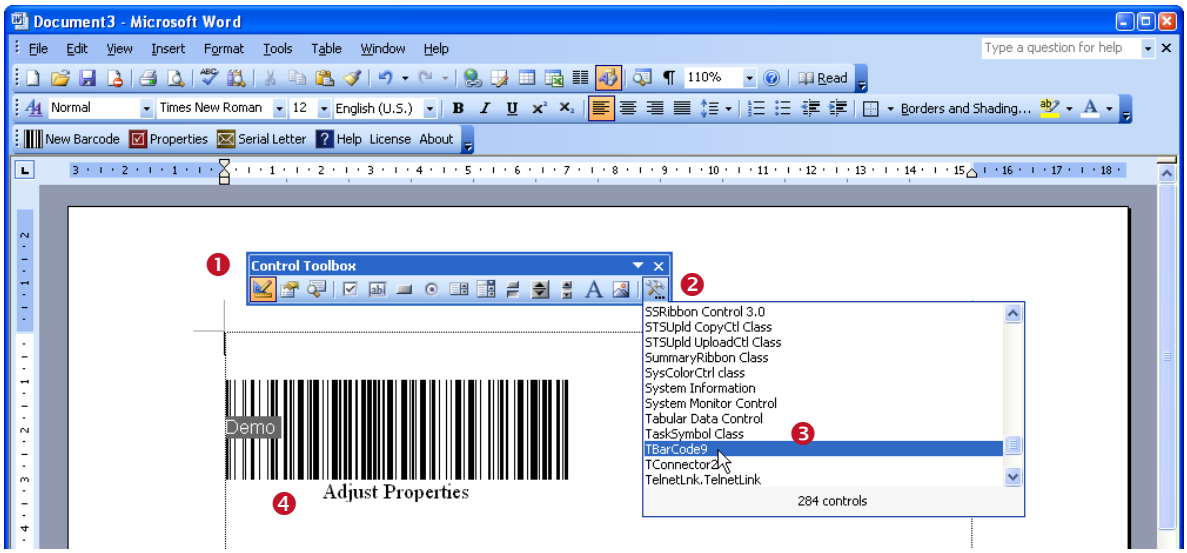


Figure 2: Insert Barcode using the Control Toolbox (Microsoft Word)

► Please note: In Word and Excel the toolbar is named *"Control Toolbox"*, in Access just *"Toolbox"*.

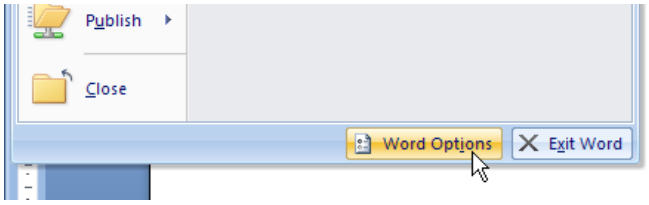
Application	How to insert
Word Excel Access	▪ If the *Control Toolbox* ❶ is not visible, please open it as follows: - right-click on one of the visible toolbars and select *Control Toolbox* or - select *View* ► *Toolbars* ► *Control Toolbox* from the menu. ▪ Click on the *More Controls* icon❷. – A list with available controls will appear (see❸). ▪ Select the entry *TBarCode11.* ▪ Now move the mouse cursor to the desired position and click the left mouse button. The **TBarCode** control ❹ will be inserted.
InfoPath	Please refer to section 9.2.3.

5.3 Microsoft Office 2007

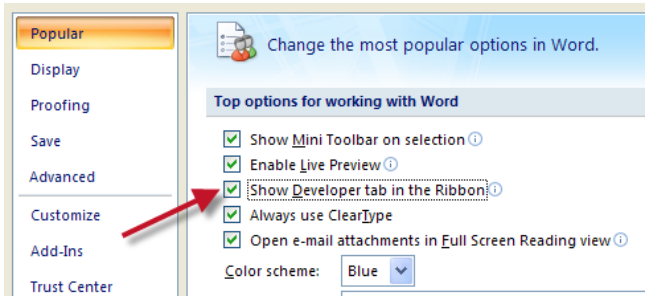
5.3.1 Insert Barcode in Word 2007

You can also insert a barcode as follows:

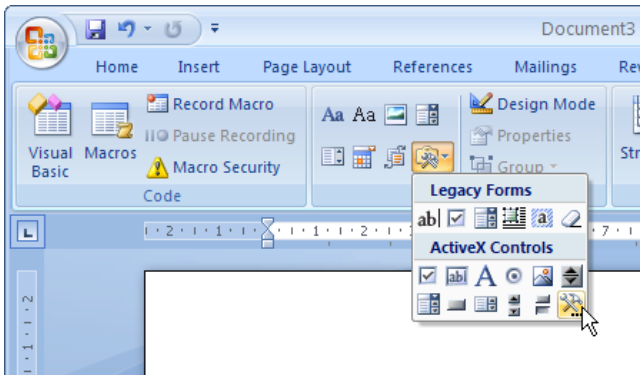
- Click the Office button on the top left of the Word window and then select *Word Options.*



- Enable the Developer tab in the Ribbon:



- Then go to the Developer tab and click *Legacy Tools ► More Controls.* Select *TBarCode11* from the list of ActiveX Controls and confirm with *OK*. The barcode will be inserted at the current cursor position.



5.3.2 Insert Barcode in Excel 2007

- Enable the Developer tab in the Ribbon (Excel Options)

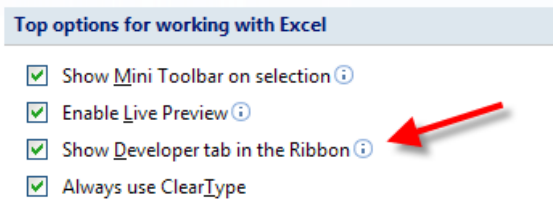

Top options for working with Excel
Show Mini Toolbar on selection
Enable Live Preview
Show Developer tab in the Ribbon
Always use ClearType

Figure 3: Excel 2007: Excel Options - Show Developer tab

- Go to the Developer tab and select *Insert ► More Controls*

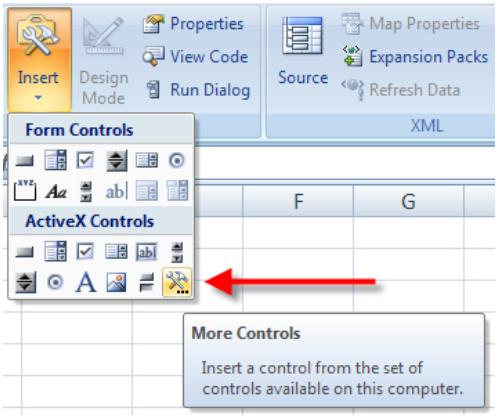


Figure 4: Excel 2007: More Controls

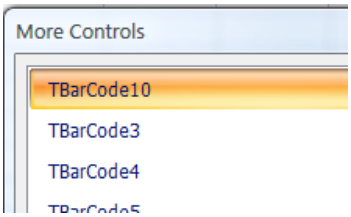


Figure 5: Excel 2007: Select TBarCode11

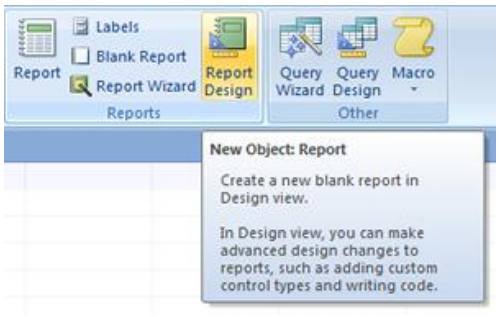
- Select *TBarCode11* from the list of object types and confirm with *OK*.
- Now move the mouse cursor to the desired position and draw a rectangle to the position where the bar code should be. A **TBarCode** control will be inserted.

► Please note: In Word 2007 and Excel 2007 the *"Control Toolbox"* can be found in the Developer tab, in Access 2007 inside the Design Tab.

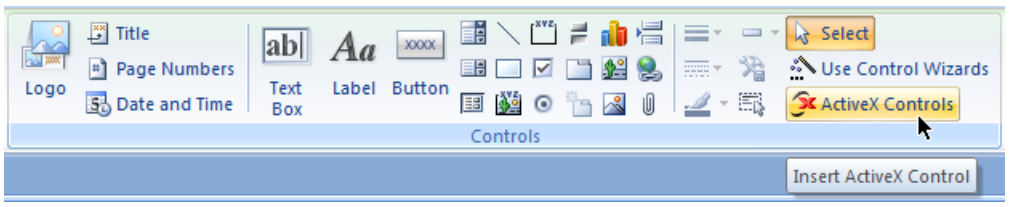
For inserting barcodes in Microsoft Excel 2003 use the **TBarCode** *QuickStart* manual provided in the Windows start menu.

5.3.3 Insert Barcode in Access 2007

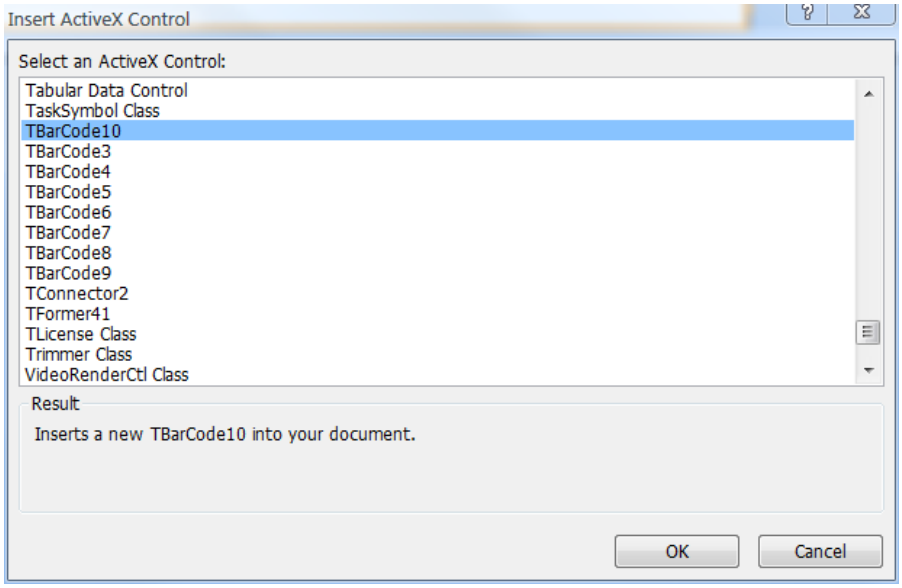
- Open a new report in *Design View.*



- Click the *ActiveX Controls* symbol in the Design tab Controls section.



- Select *TBarCode11* from the list of ActiveX Controls and confirm with *OK*.



- A **TBarCode** control will be inserted.

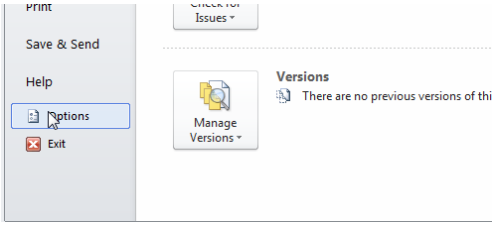
► For adjusting the barcode properties right click the bar code control and select *TBarCode11 Object* ► *Properties* from the context menu (see also 6.3).

For inserting barcodes in Microsoft Access 2003 use the **TBarCode** *QuickStart* manual provided in the Windows start menu.

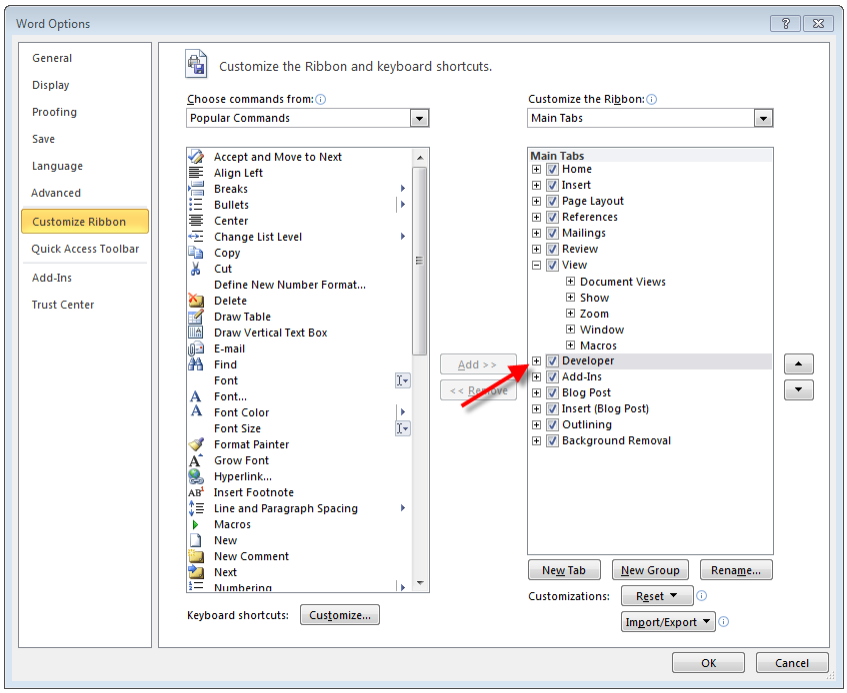
5.4 Microsoft Office 2010 / Office 2013

5.4.1 Insert Barcode in Word 2010 / Word 2013

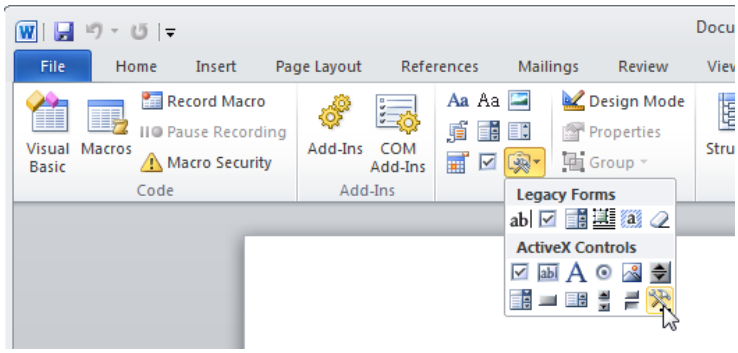
- Select *File* ► *Options.*



- Go to the page *Customize Ribbon* and check the list entry *Developer*.



- Then go to the Developer tab and click *Legacy Tools ► More Controls.* Select *TBarCode11* from the list of ActiveX Controls and confirm with *OK*. The barcode will be inserted at the current cursor position.



5.4.2 Insert Barcode in Excel 2010 / Excel 2013

- Enable the Developer tab in the Ribbon (*File ► Options ► Customize Ribbon*)

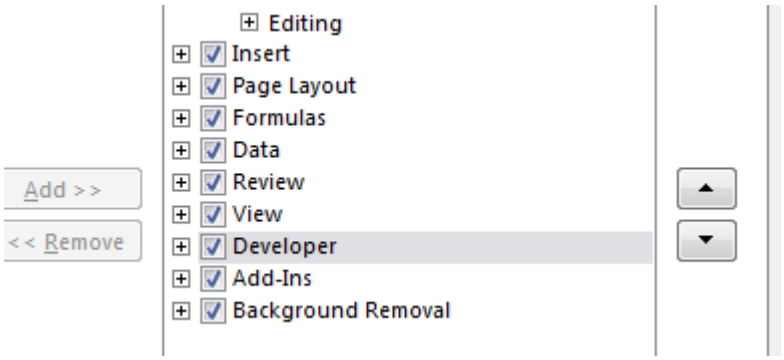


Figure 6: Excel 2010: Excel Options - Show Developer tab

- Go to the Developer tab and select *Insert* ► *More Controls*

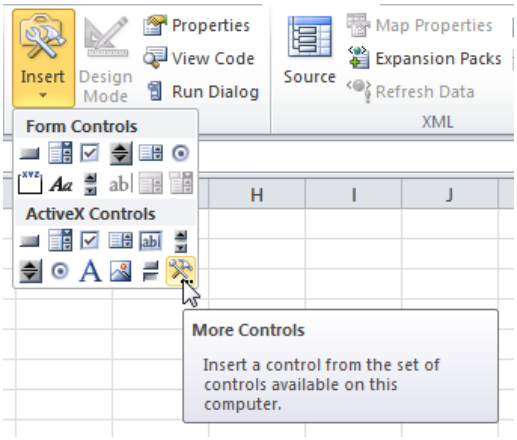


Figure 7: Excel 2010: More Controls

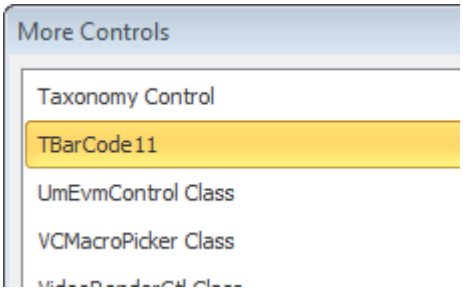


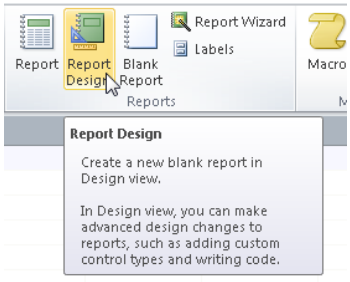
Figure 8: Excel 2010: Select TBarCode11

- Select *TBarCode11* from the list of object types and confirm with *OK*.
- Now move the mouse cursor to the desired position and draw a rectangle to the position where the bar code should be. A **TBarCode** control will be inserted.

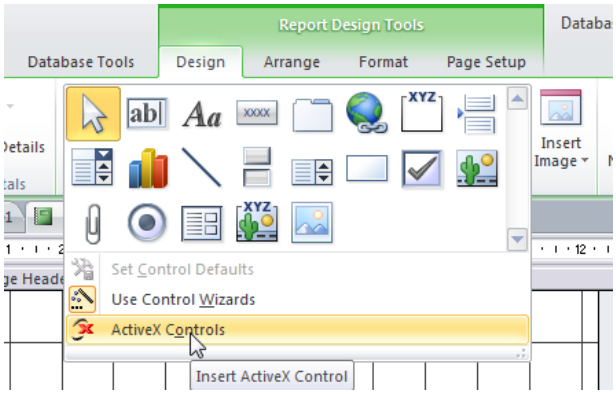
► Please note: In Word 2010 and Excel 2010 the *"Control Toolbox"* can be found in the Developer tab, in Access 2010 inside the Design Tab.

5.4.3 Insert Barcode in Access 2010 / Access 2013

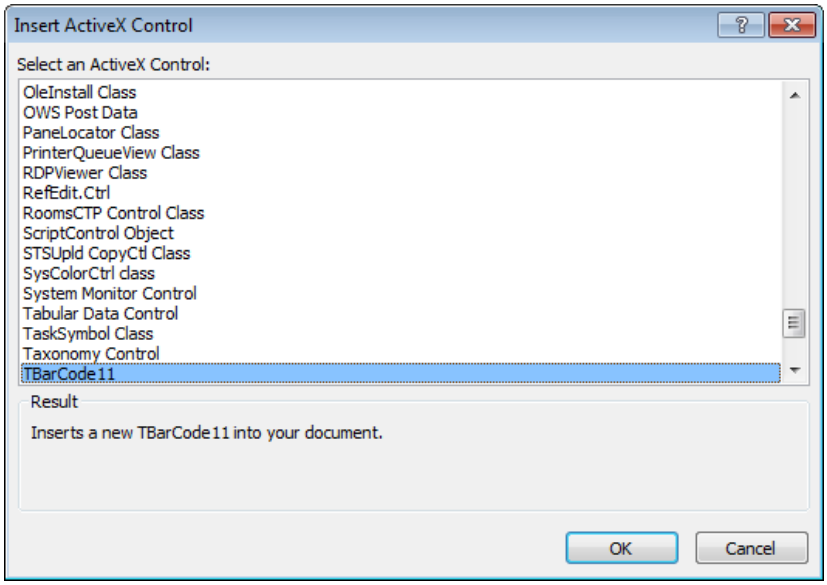
- Open a new report in *Design View* (*Create* ► *Report Design*).


Report
Report Design
Blank Report
Report Wizard
Labels
Reports
Macro
Report Design
Create a new blank report in Design view.
In Design view, you can make advanced design changes to reports, such as adding custom control types and writing code.

- Click the *ActiveX Controls* symbol in the section *Design* ► *Controls*.



- Select *TBarCode11* from the list of ActiveX Controls and confirm with *OK*.



- A **TBarCode** control will be inserted.

► For adjusting the barcode properties right click the bar code control and select *TBarCode11 Object* ► *Properties* from the context menu (see also 6.3).

5.5 Insert Barcode per Code

Using VBA (Visual Basic for Applications) you can insert the barcode per code. For more information, please refer to section 8.3.

6 Adjust Barcode Parameters

6.1 General

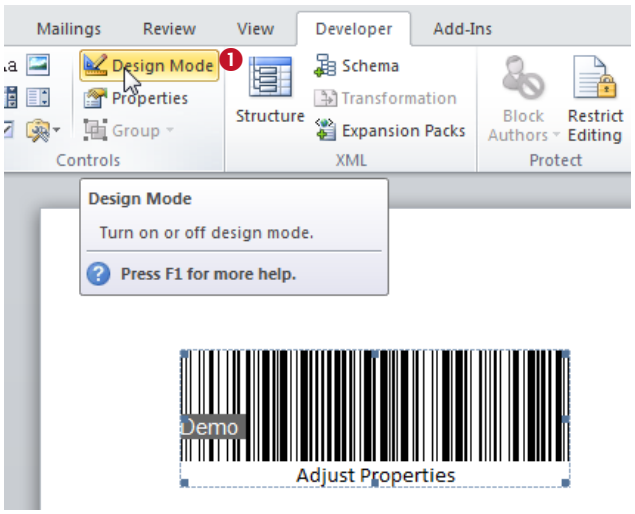
TBarCode offers the possibility to change all barcode related settings (barcode type, barcode data, check digit method, barcode appearance, etc.) to your needs. There are three different methods for changing barcode parameters. These methods are explained in section 6.3.

> ► Please keep in mind:
> In order to select, move, resize, edit and program the **TBarCode** control you have to be in *Design Mode.* When leaving the design mode, the control is locked and cannot be edited.

6.2 Activate the Design Mode

Application	How to activate the Design Mode
Word	See section 6.2.1.
Excel	
Access	See section 6.2.2.
InfoPath	See section 9.2.

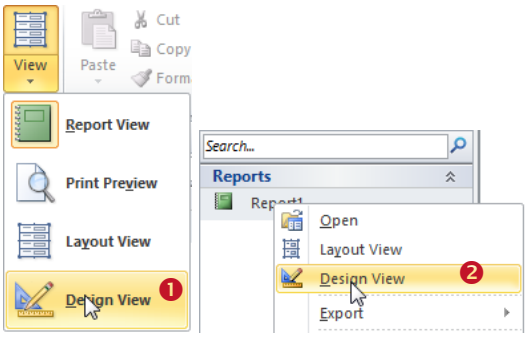
6.2.1 Microsoft Word or Excel



Switch to *Design Mode* by clicking on the triangle symbol ❶ in the *Developer Ribbon*.

If this ribbon is not visible, please refer to *chapter 5*.

6.2.2 Microsoft Access



You can activate the *Design Mode* when opening the form (or report):

- Open the desired form (or report) by double-click and choose *Design View* ❶ from the menu.

or

- Right-click on the form/report name and select *Design View* (❷) from the pop-up menu.

6.3 Barcode Parameters

The barcode parameters can be adjusted either by using the *Property Pages*, the *Property List* or *VBA Code.*
Except for some special settings (which are available in the property list or via code only) TEC-IT recommends the use of the property pages. The property pages are designed for easy adjustment of the **TBarCode** properties.

6.3.1 Property Pages

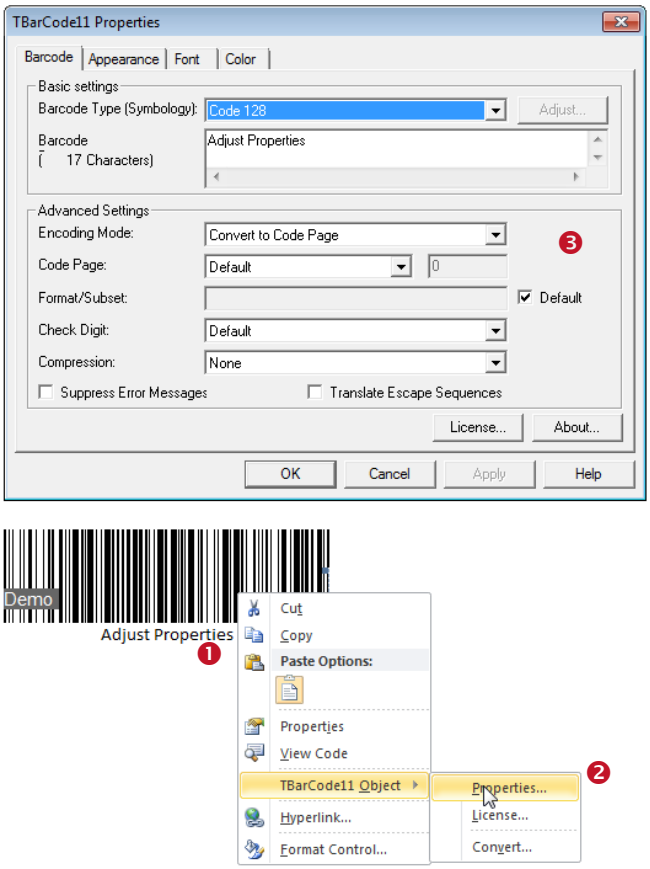


Figure 9: Property Pages (Microsoft Word)

Application	How to open the Property Pages
Word Excel Access	▪ Make sure that you are in *Design Mode* (see section 6.2). ▪ Right-click on the **TBarCode** object ❶. ▪ Select *TBarCode11 Object* ► *Properties* from the pop-up menu (❷). ▪ The property pages ❸ will appear.
InfoPath	▪ Make sure that you are in *Design Mode*. ▪ Right-click on the **TBarCode** object and select *TBarCode11 Properties…*

► For detailed information about the property pages and about the available settings, please refer to chapter 10.

6.3.2 Property List

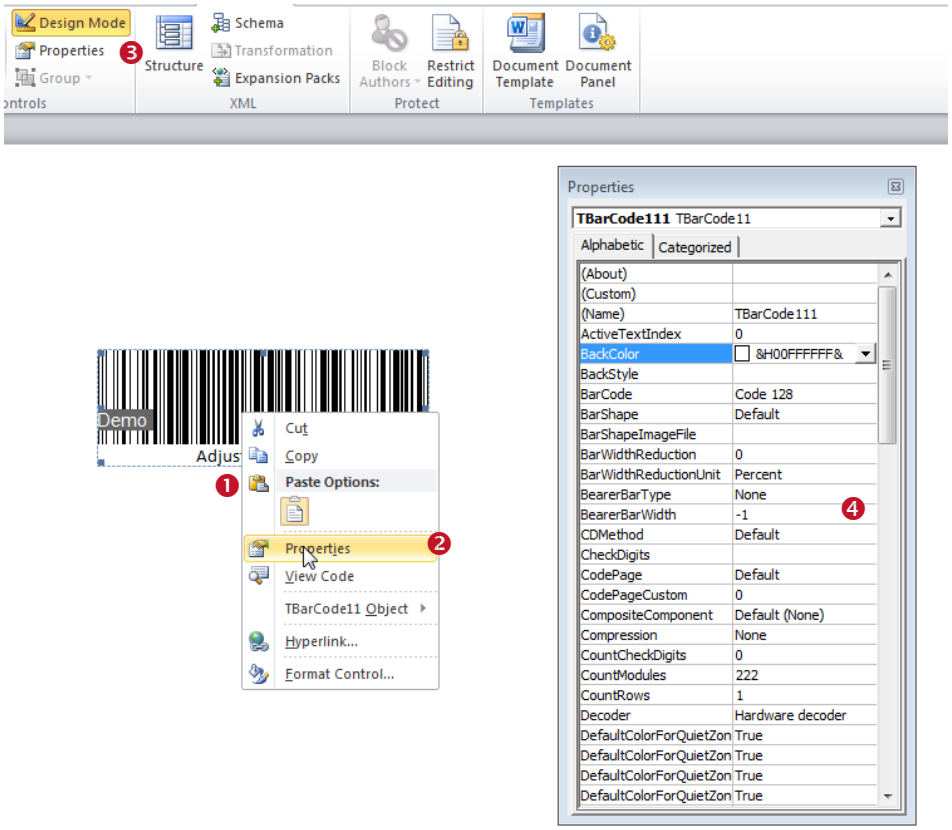


Figure 10: Property List (Microsoft Word)

Application	How to open the Property List
Word Excel Access	▪ Make sure that you are in *Design Mode* (see section 6.2). ▪ Right-click on the **TBarCode** object ❶ and select *Properties* (❷) from the pop-up menu. As an alternative you can also select the barcode and click on the *Properties* icon ❸ in the *Control Toolbox.* ▪ The property pages ❹ will appear.
InfoPath	No property list available.

► Some properties – in particular data binding *("Linked Cell"* in Excel or *"Control Source"* in Access) – are available in the property list only. For more information on data binding, please refer to section 7.3.

6.3.3 Adjust Parameters per Code

Using VBA (Visual Basic for Applications) you can adjust the barcode parameters per code. For more information, please refer to section 8.4.

7 Set Barcode Data (Data Binding)

7.1 General

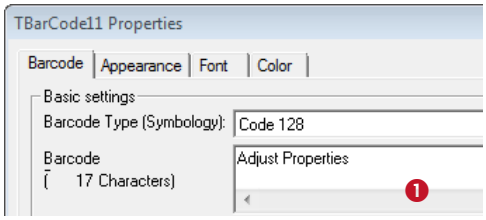
The barcode data can be provided in three ways:

- Manually
- Via Data Binding
- Via VBA (Visual Basic for Applications)

7.2 Specify Data Manually

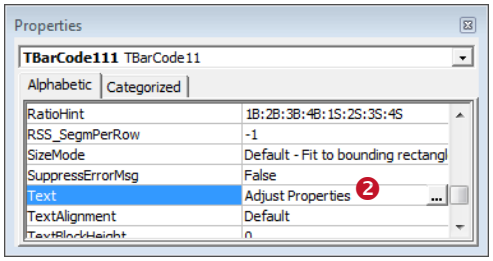
You can specify the barcode data in the property pages or the property list:

7.2.1 Property Pages



- Open the property pages (see section 6.3.1).
- Select the *Barcode* tab.
- Enter the desired text in ❶.

7.2.2 Property List



- Open the property list (see section 6.3.2).
- Select the *Text* property.
- Enter the desired text in ❷.

7.3 Data Binding

Some Microsoft Office applications provide the option to bind the content of a specified data field to the **TBarCode** control (“data binding”). This means that the barcode control will use the content of the data field as barcode data. Whenever you change the content of the data field the barcode symbol will be updated as well.

Application	Data Binding
Word	Not available.
Excel	See section 7.3.1.
Access	See section 7.3.2.
InfoPath	See sections 9.2.2 to 9.2.4.

7.3.1 Microsoft Excel

Data binding can be enabled via the property *LinkedCell:*

- Make sure that you are in *Design Mode* (see section 6.2).
- Select the **TBarCode** object ❶.
- Then click on the *Properties* icon ❷ in the *Control Toolbox.*
- The property list ❸ will appear.
- Select the property *LinkedCell* and enter the name of the cell that you want to bind to the **TBarCode** control (see ❹). In this sample *B4* ❺ is used.

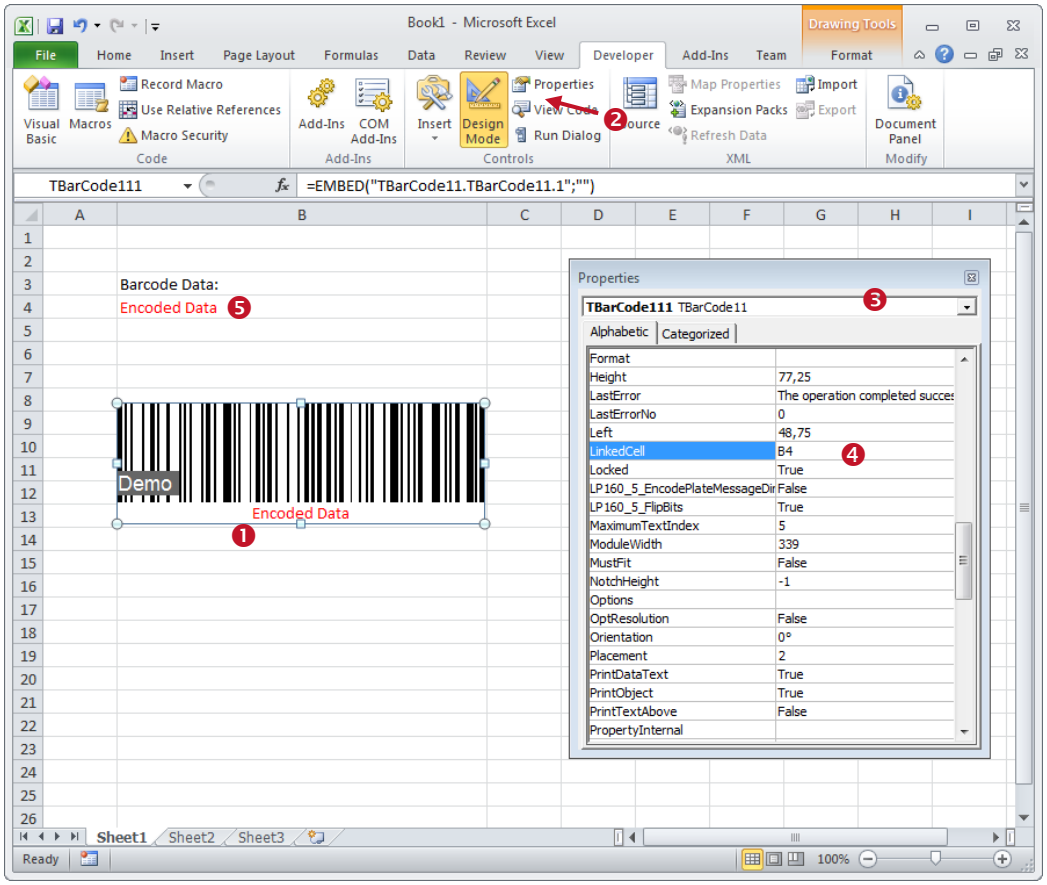


Figure 11: Data Binding in Microsoft Excel

7.3.2 Microsoft Access

The barcode control is likely to be used in reports and forms. Barcode data can be added manually or automatically by binding it to a table column. In the second case the barcode changes according to the data record which is currently being displayed.

In order to bind the barcode to a data source, please execute the following steps:

- Right-click on the **TBarCode** object ❶.
- Select *Properties* from the pop-up menu ❷.
- Select the *Data* tab ❸.
- For the property *Control Source* select the data field (or the query) that serves as source for the barcode content (see ❹).
  This step is only possible if you have previously defined a data-source for the report/form.
  You can do this by opening the properties dialog for the entire report.

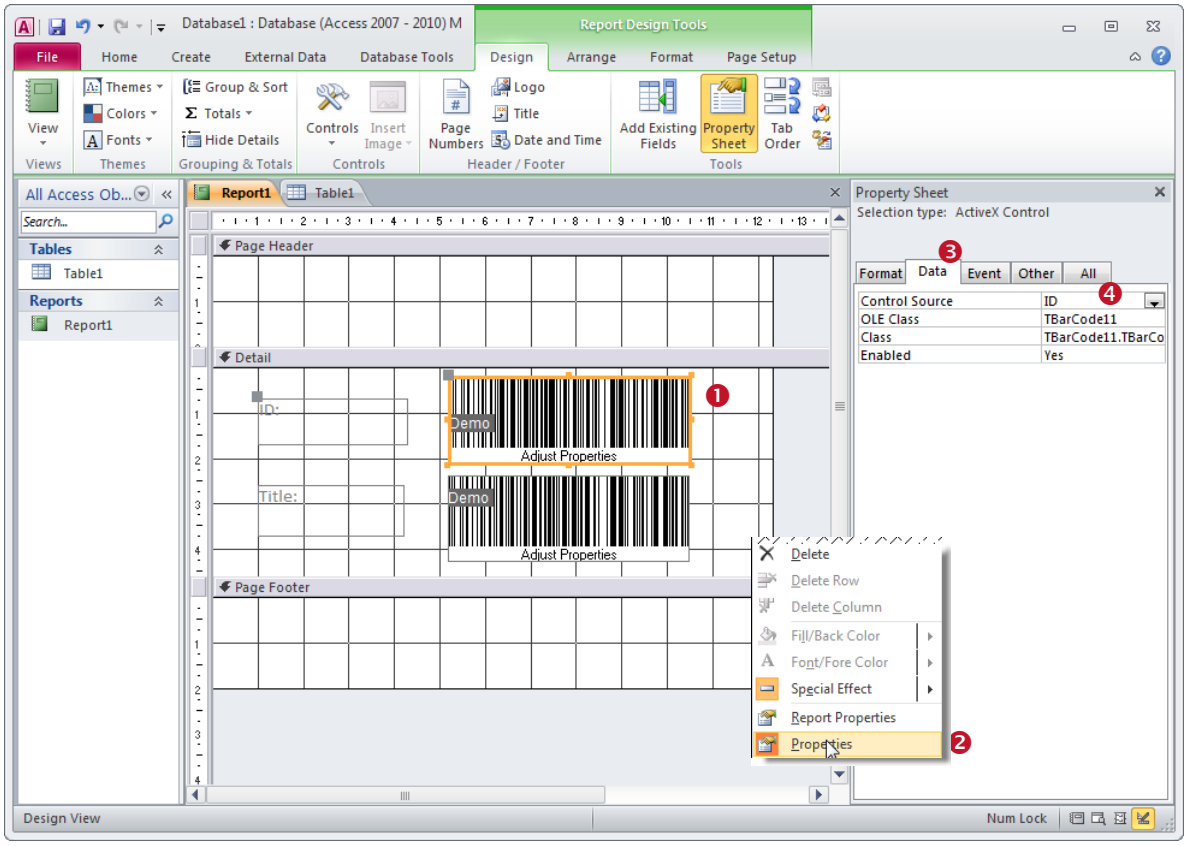


Figure 12: Data Binding in Microsoft Access

- Please ensure that the barcode type corresponds with the data that you want to encode. If the source string contains characters which cannot be encoded with the selected symbology, an error message will be displayed instead of the barcode.
- Hint: You can also enter a fixed value or an expression as data source.
  Example: The expression "=[ArticleNo]+[Price]" could be used for concatenating the data fields *ArticleNo* and *Price* for the *EAN13 P5.*

7.3.3 Specify Data via VBA Code

Using VBA (Visual Basic for Applications) you can specify the barcode data per code. For more information, please refer to section 8.4.

8 Programming TBarCode (VBA)

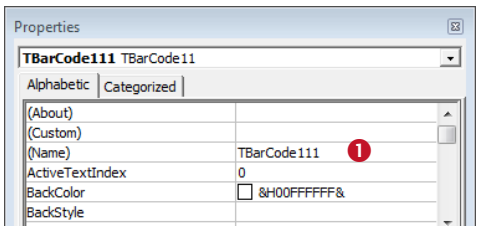
8.1 General

TBarCode can be used in Microsoft Office and all other applications (e.g. development environments) which support ActiveX controls. The **TBarCode** object can be inserted as part of any form, document, report or spreadsheet, and it can be created as (invisible) instance which is used for printing only.

This chapter gives basic introductions on how to use the **TBarCode OCX** with VBA. For additional information and sample applications check out Appendix A.

8.2 Microsoft Office and VBA

In Microsoft Office all barcode properties (barcode type, barcode data, barcode size, etc.) and methods can be accessed directly via VBA code.



Upon insertion the **TBarCode** control is usually named "TBarCode11*n*" (where *n* is a consecutive number). This name can be used for addressing the **TBarCode** control in the VBA code.

You can view (and also edit) this name by right-clicking on the respective barcode symbol. Then select *Properties…* from the pop-up menu. The name of the control is shown in ❶.

► To edit and to program the **TBarCode** control the design mode is required. For accessing the control in your VBA code use the name as assigned in ❶.

► Hint: If you double-click the control in design mode the VBA editor is opened (not shown).

► For a list of available properties and methods and for a detailed description of the **TBarCode** programming interface, please refer to the developer documentation (see Appendix A).

8.3 Insert Barcode

The following code samples can be used to create and to insert a barcode object in Office applications. You can execute the code with a macro or you can trigger it with a control event (e.g. button-click).

Application	How to Insert Barcode
Word	See section 8.3.1.
Excel	See section 8.3.2.
Access	No example available.
InfoPath	No VBA supported.

8.3.1 Microsoft Word

This sample shows how to insert a Code-128 symbol at the actual cursor position. The barcode data will be set to “1234567890”.

```
Dim oShape As InlineShape
Dim oTBC   As Object

' Insert a shape containing a barcode object at the actual cursor position.
Set oShape = Selection.InlineShapes.AddOLEObject(ClassType:="TBarCode11.TBarCode11.1", _
  FileName:="", LinkToFile:=False, DisplayAsIcon:=False)

' Activate the barcode object.
oShape.OLEFormat.Activate

' Adjust the size of the barcode by adjusting the shape.
' (The barcode object extends to the size of the shape by default).
oShape.Width = 200
oShape.Height = 100

' Get the barcode object within the shape.
Set oTBC = oShape.OLEFormat.Object

' Adjust the barcode object properties (barcode type, barcode data...)
oTBC.BarCode = 20              ' select Code-128 (TBarCode11Lib.eBC Code128)
oTBC.Text = "1234567890"      ' set barcode data
```

► This samples inserts **TBarCode** as *OLE Object.* To insert the barcode as *OLE Control* you have to use the command *AddOLEControl.*

8.3.2 Microsoft Excel

This sample shows how to insert a Code-128 symbol in cell “C3” on the current spreadsheet. The barcode data will be set to “123456” and the size of the human readable text to 8 points.

```
Dim TargetCell As Variant     ' The cell, in which you want to insert the barcode
Dim CellHeight As Variant     ' Height of the target cell
Dim CellWidth  As Variant     ' Width of the target cell
Dim CellTop    As Variant     ' Top coordinates of the target cell
Dim CellLeft   As Variant     ' Left coordinates of the target cell
Dim BCObject   As OLEObject   ' The TBarCode container object

TargetCell = "C3"

' Make sure that the cell height has 30 pixels minimum
If (Range(TargetCell).RowHeight < 30) Then
  Range(TargetCell).RowHeight = 30
End If

' Get target cell dimensions
CellHeight = Range(TargetCell).Height
CellWidth = Range(TargetCell).Width
CellTop = Range(TargetCell).Top
CellLeft = Range(TargetCell).Left

' Insert barcode object into selected cell
Set BCObject = ActiveSheet.OLEObjects.Add(ClassType:="TBarCode11.TBarCode11.1", _
  Left:=CellLeft, _
  Top:=CellTop, _
  Width:=CellWidth, _
  Height:=CellHeight)

' Adjust the barcode object properties (barcode type, barcode data...)
BCObject.Object.BarCode = 20         ' select Code-128 (TBarCode11Lib.eBC_Code128)
BCObject.Object.Text = "123456"      ' set barcode data
BCObject.Object.FontSize = 8         ' set size of human readable text
```

► Via VBA code the barcode can only be inserted as *OLE Object* (not as *OLE Control).*

8.4 Adjust Barcode Parameters and Barcode Data

Application	How to Adjust Barcode Parameters
Word	See section 8.4.1.
Excel	
Access	See section 8.4.2.
InfoPath	No VBA supported.

8.4.1 Microsoft Word or Excel

The example below shows basic **TBarCode** method calls. The barcode object is identified by the name “TBarCode111” (see section 8.2).

```
TBarCode111.BarCode = TBarCode11Lib.eBC_DataMatrix ' select the barcode type Data Matrix
TBarCode111.Text = "Hello World!"                  ' set the barcode data
```

8.4.2 Microsoft Access

► To access the barcode properties and methods you have to use the *"object"* interface.

The example below sets the barcode data (text property) of **TBarCode.** The barcode object is identified by the name “TBarCode111” (see section 8.2)

```
TBarCode111.Object.Text = "1234567890"              ' set the barcode data
```

8.5 License TBarCode

Call the method *LicenseMe()* from within your application. Do this before barcodes are generated or printed. Before calling this function the TBarCode OCX control must be instantiated, otherwise an error message will be received.

To license **TBarCode** use the following VBA call:

```
TBarCode111.LicenseMe "Licensee", eLicKindDeveloper, 1, "LicenseKey", eLicProd1D
```

9 Barcodes in Microsoft InfoPath®

9.1 General

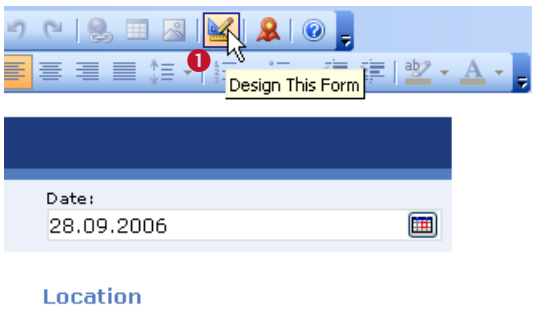
In order to use **TBarCode** in Microsoft InfoPath you have to perform the following steps:

- Open your form in *Design Mode* (see section 9.2).
- Add **TBarCode** to the *Custom Controls* (see section 9.2.2). This step is required only once. It enables Microsoft InfoPath to use **TBarCode.**
  During this step you have to specify the data source type for **TBarCode.** You have to decide whether you want to encode:
  - the content of single data fields or
  - the underlying InfoPath XML document (or parts of the XML document).
- Insert the barcode (see section 9.2.3).
- Change the data binding (optional) – see section 9.2.4.
- Adjust barcode parameters (see section 9.2.5).

9.2 InfoPath 2003

9.2.1 Activate the Design Mode

Please note: you have to be in *Design Mode* to add barcodes to a form design, to select, move, resize and to adjust the barcode parameters.



You can activate the *Design Mode* by clicking on the triangle symbol ❶ in the *Standard* toolbar. – The design view will be opened in a separate window.

9.2.2 Add TBarCode to the Custom Controls

To add **TBarCode** to the *Custom Controls,* please follow the steps below:

- Make sure that you are in *Design Mode* (see 9.2).
- Open the *Task Pane* ❷. Therefore select *View* ► *Task Pane* from the menu (see ❶).

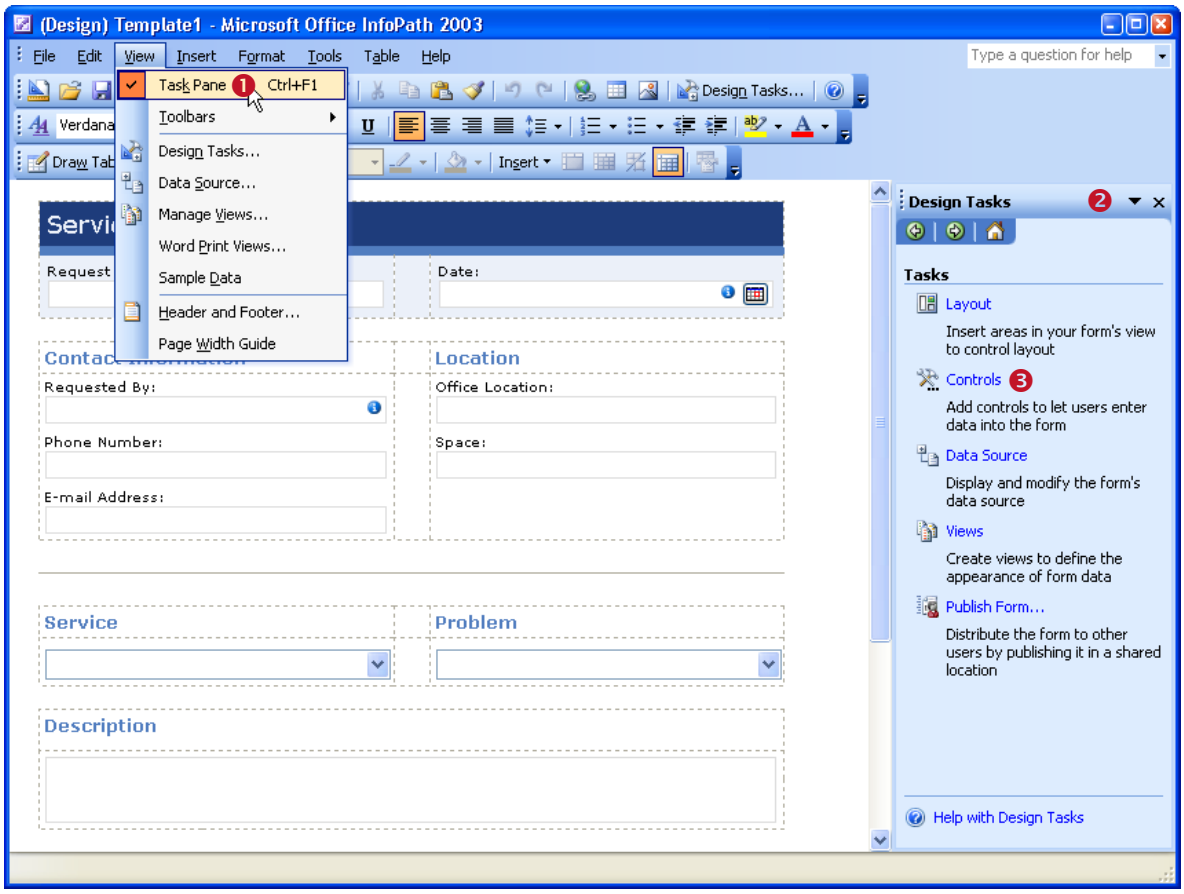


Figure 13: Add TBarCode to the Custom Controls in Microsoft InfoPath 2003 (1)

- In the *Task Pane* click on *Controls* ❸.
- Then click on *Add or Remove Custom Controls…* at the bottom of the updated pane view (see ❹). A dialog will appear. This dialog shows a list of installed custom controls.
- Click the *Add…* button ❺ to open the *"Add Custom Control Wizard"*.
- Locate and select *TBarCode11* in list ❻, then click *Next.*
- On the following wizard pages you have to specify the data source type for **TBarCode.** This selection determines, how the barcode control can be used in InfoPath later on.
  For more information, please see below.

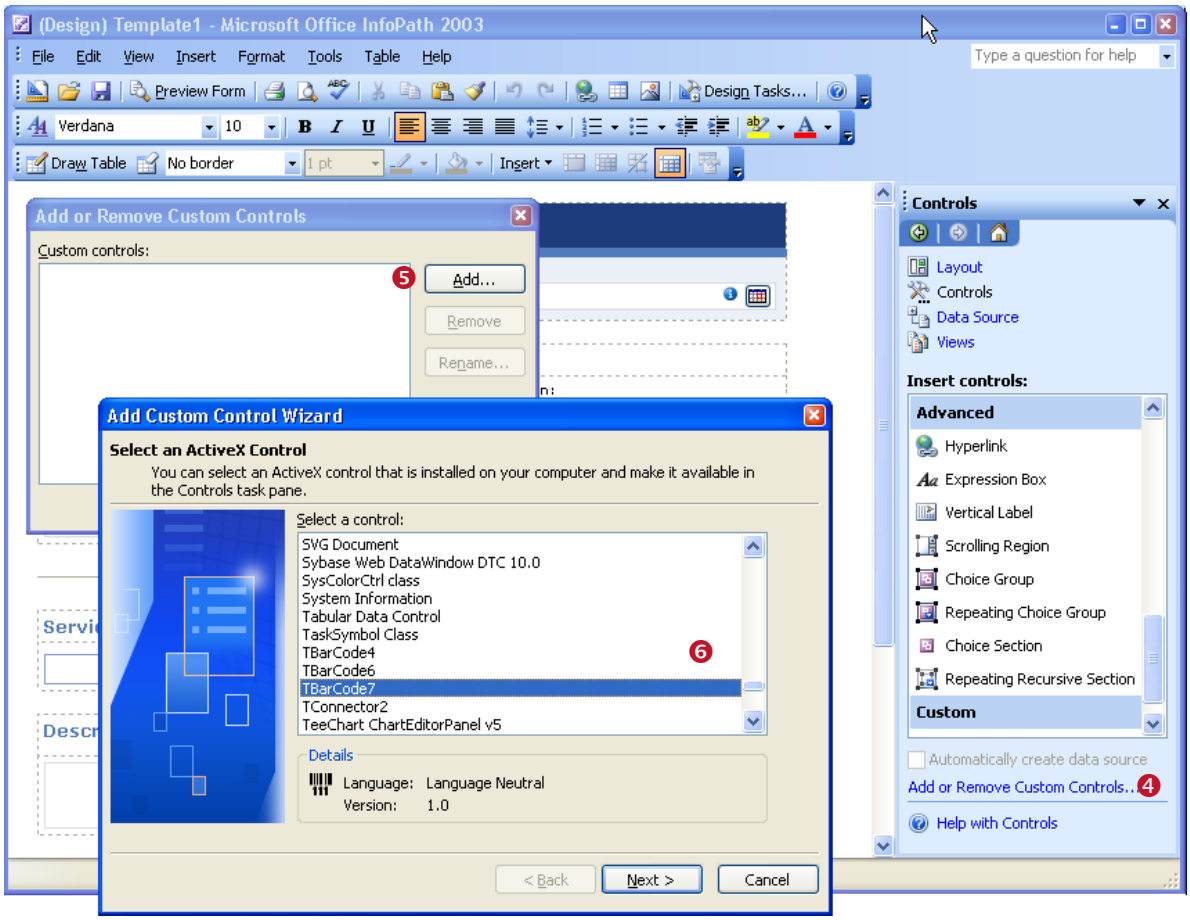


Figure 14: Add TBarCode to the Custom Controls in Microsoft InfoPath 2003 (2)

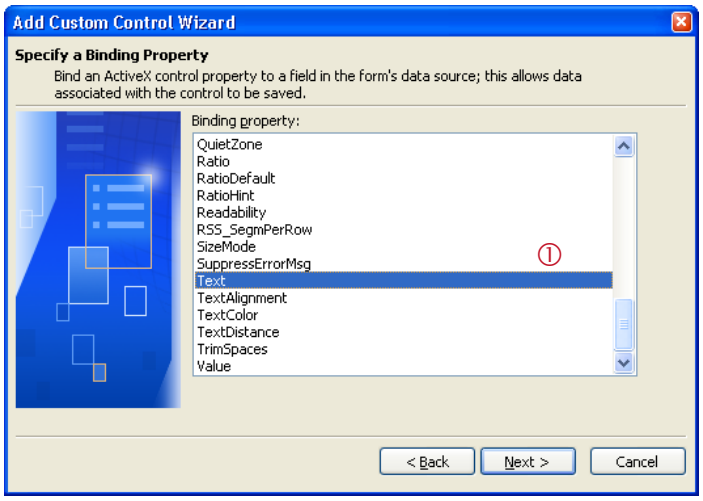
9.2.2.1 Specify Data Source Type

In the *"Add Custom Control Wizard"* you have to decide which kind of data you want to encode:

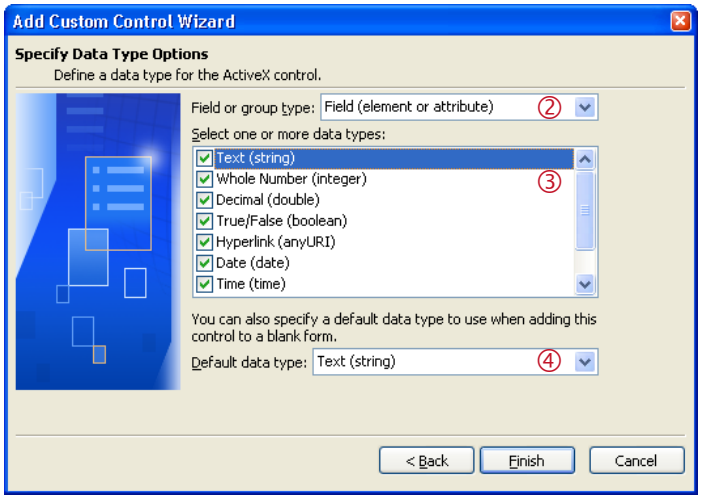
- If you plan to encode single data fields (e.g. the content of an input box), please follow the instructions in section 9.2.2.1.1.
- If you plan to encode the underlying InfoPath XML document (or parts of the XML document), please follow the instructions in section 9.2.2.1.2.

9.2.2.1.1 Encode Single Data Fields

Perform these steps if you plan to encode single data fields:



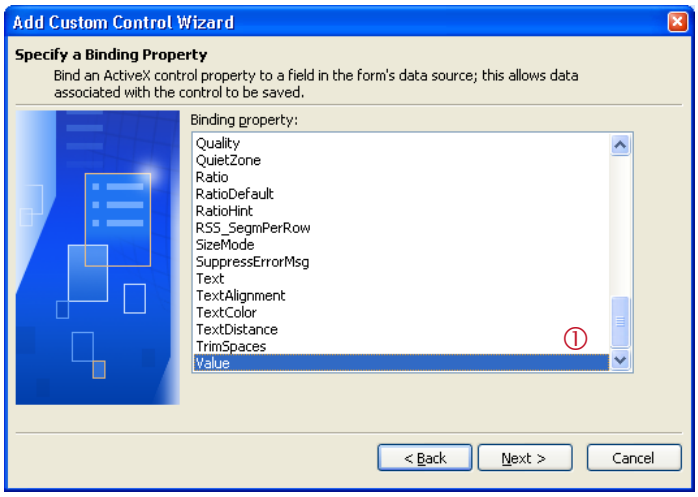
- Select the binding property *Text* (see ①).
- Click *Next.*
- On the next page *("Specify and Enable or Disable Property")* select the entry *Enabled*.
- Click *Next.*



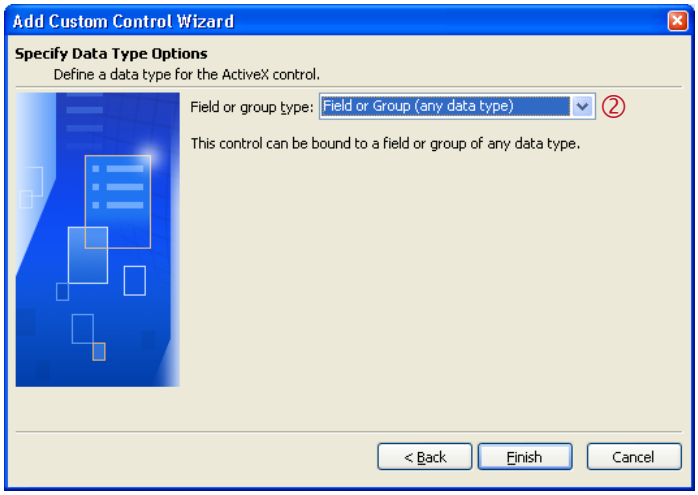
- In ② select *"Field (element or attribute)".*
- Then select all data types (by clicking each single line in ③).
- Leave the default data type ④ as "*Text (string)*".
- Then click *Finish.*

9.2.2.1.2 Encode Complete or Partial Form Content (XML Data)

Perform these steps if you plan to encode XML data:



- Select the binding property *Value* (see ①).
- Click *Next.*
- On the next page *("Specify and Enable or Disable Property")* select the entry *Enabled*.
- Click *Next.*


Add Custom Control Wizard
Specify Data Type Options
Define a data type for the ActiveX control.
Field or group type:
Field or Group (any data type)
②
This control can be bound to a field or group of any data type.
< Back
Finish
Cancel

- In ② select *"Field or Group (any data type)"*.
- Then click *Finish.*

9.2.2.2 Finish Adding the Custom Control

- After you have completed the wizard, the **TBarCode** control will be listed in ❼.
- Click *OK* (❽).
- *TBarCode11* appears in the list of available controls (❾).

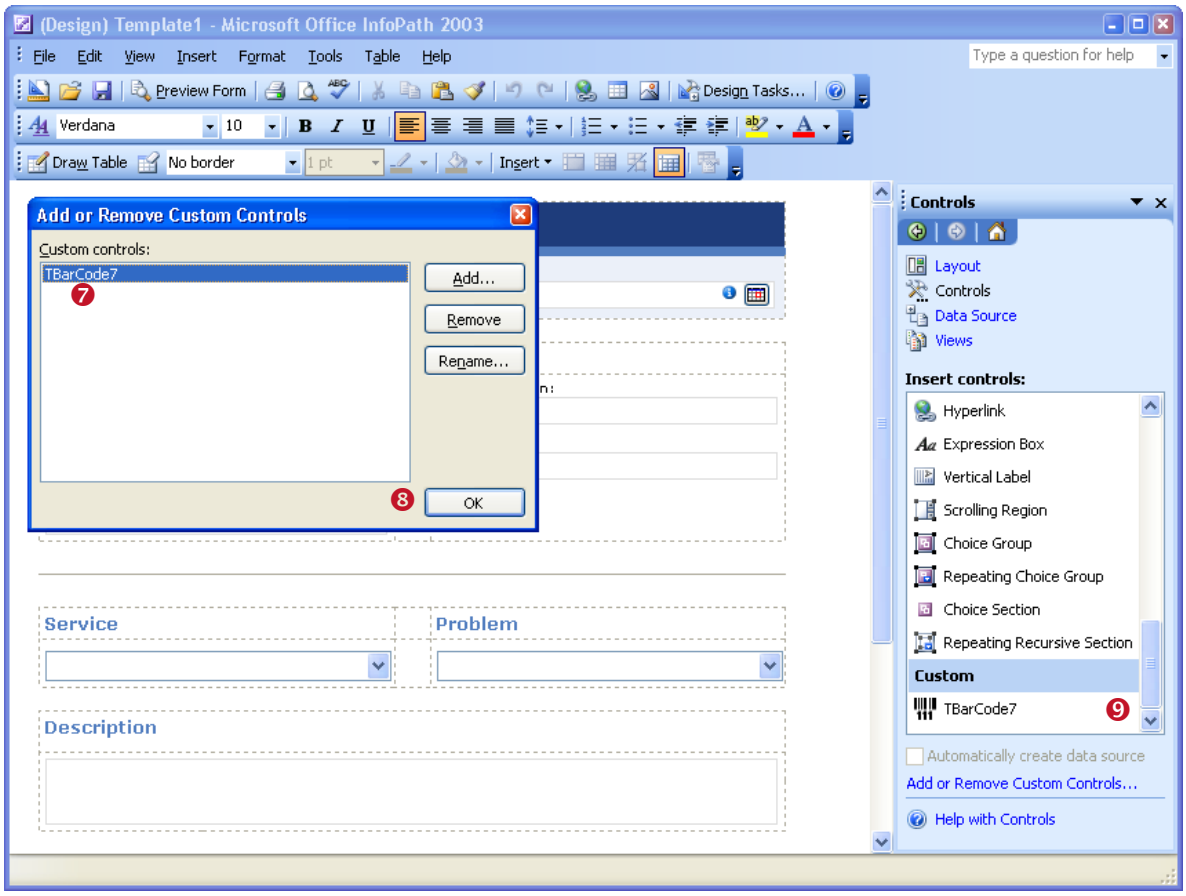


Figure 15: Add TBarCode to the Custom Controls in Microsoft InfoPath 2003 (3)

9.2.3 Insert Barcode

After you added **TBarCode OCX** to the *Custom Controls* in Microsoft InfoPath (see section 9.2.2) you can add a barcode to your document by performing the following steps:

- Place the cursor where you want to insert the barcode and click on the **TBarCode** control in the *Task Pane* (❶).
- Before the barcode is actually inserted a dialog named *"TBarCode11 Binding"* appears.
- Select the required field ( ) or group ( ) as data source (see ❷). The content of the selected entry will be encoded as barcode.

> ► Please note:
> If you have selected single data fields as data source type (see 9.2.2.1.1) you can select fields only (no groups!).

- Press *OK.* A new barcode object will be inserted.

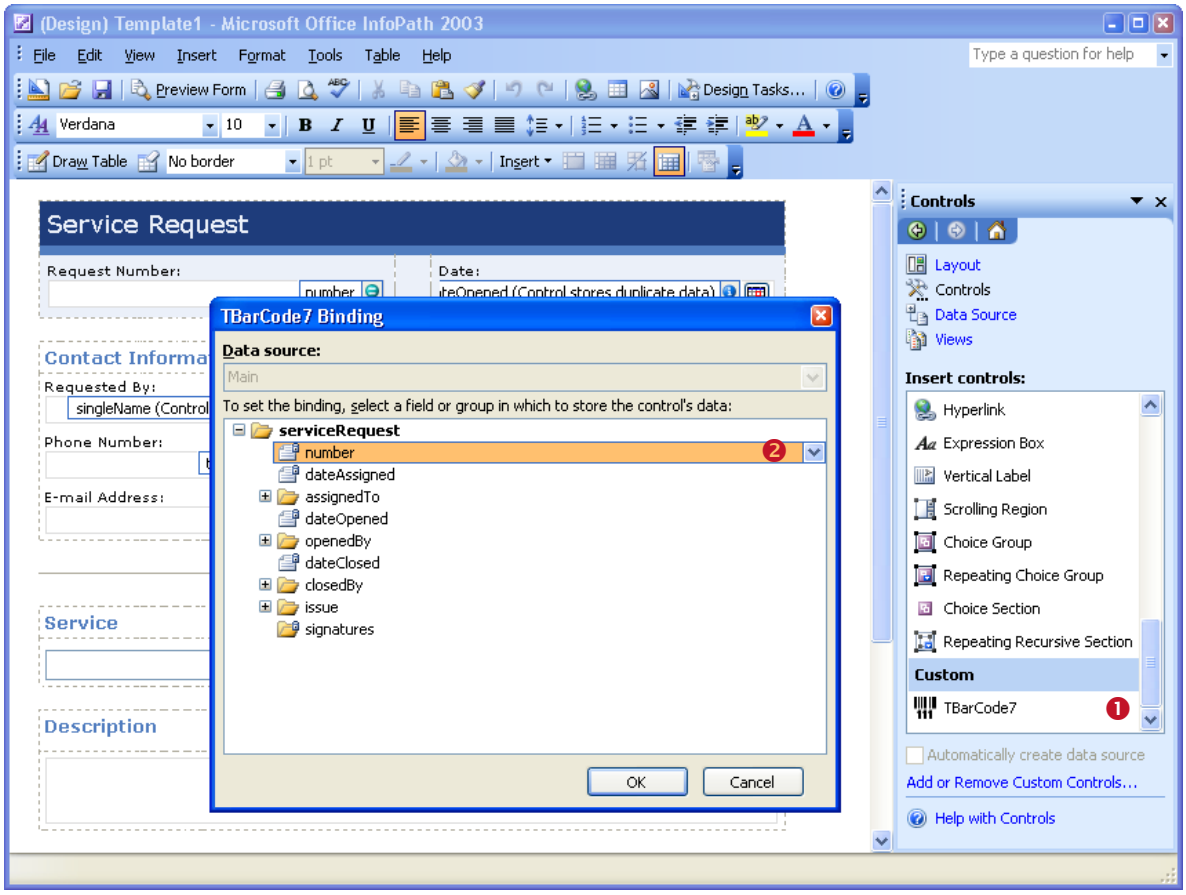
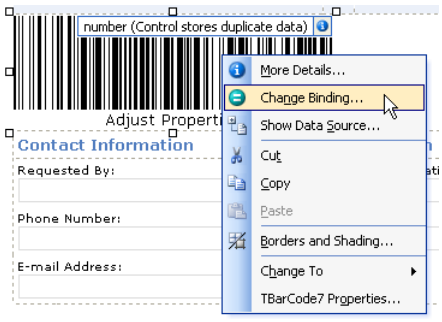


Figure 16: Insert TBarCode in a Microsoft InfoPath 2003 Document

9.2.4 Change Binding



To change the binding which was specified upon insertion of **TBarCode** (see Figure 16, ❷), right-click on the bar-code and select *Change Binding…* from the pop-up menu. The *"TBarCode11 Binding"* dialog appears.

Select a field (or group) from the tree view and confirm with *OK.*

9.2.5 Adjust Barcode Parameters

The barcode parameters can be adjusted using the *Property Pages* (a *Property List* is not available). Please open the property pages as follows:

- Right-click on the barcode object ❶.
- Select *TBarCode11 Properties…* from the pop-up menu (❷).
- The property pages ❸ will appear.

> ► For detailed information about the property pages and about the available settings, please refer to chapter 10.

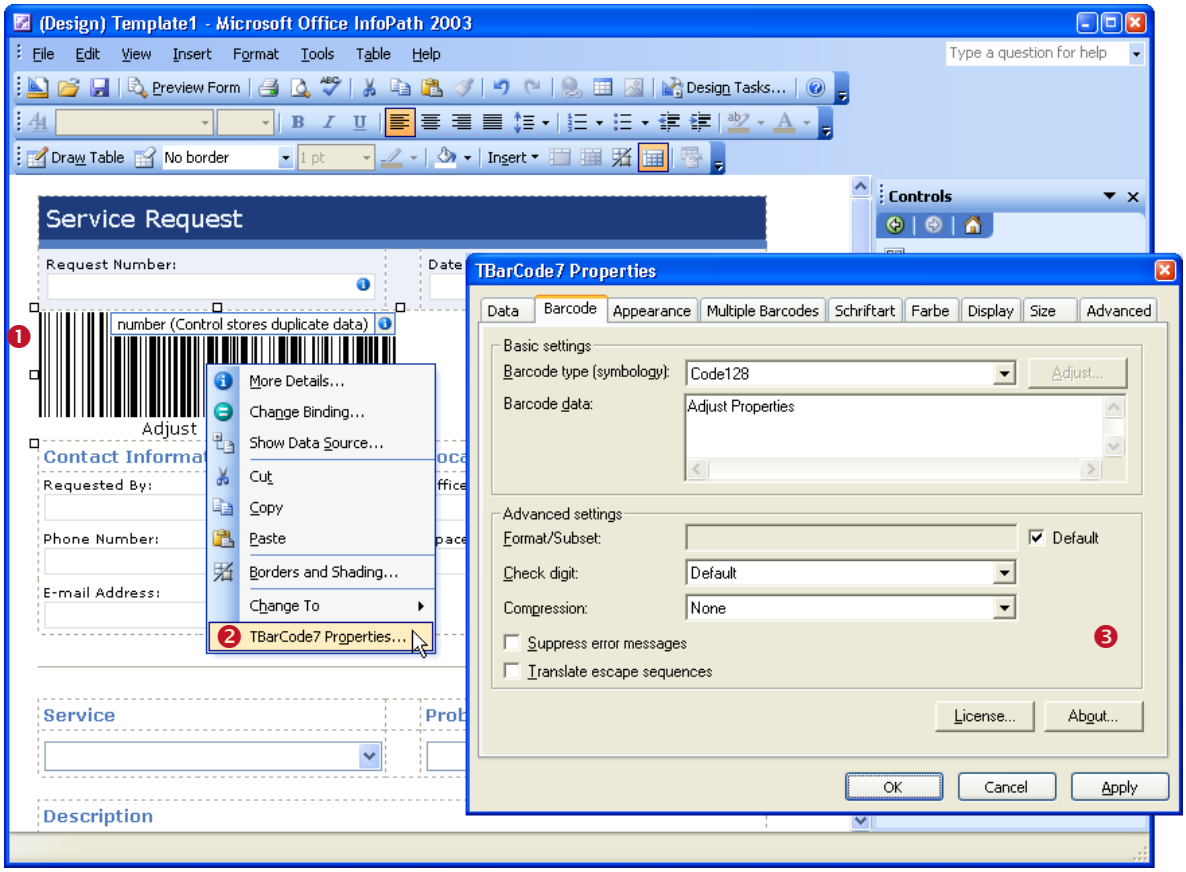


Figure 17: Adjust Barcode Properties in Microsoft InfoPath 2003

9.3 InfoPath 2010 / InfoPath 2013

Open InfoPath Designer in order to perform the steps described below. Open a form that can be filled with InfoPath Filler.

9.3.1 Add TBarCode to the Custom Controls

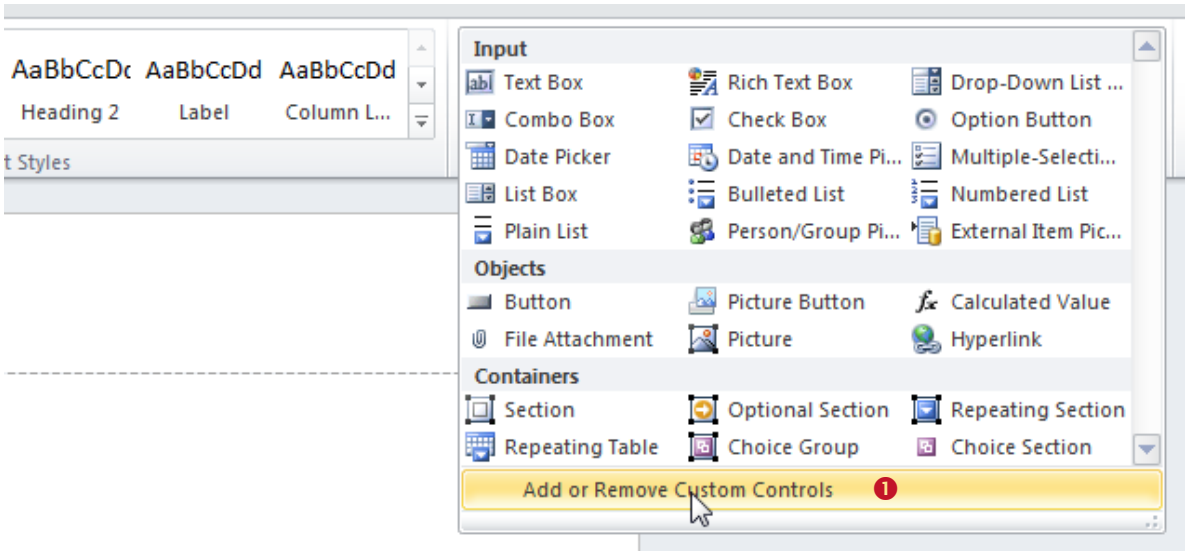


Figure 18: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (1)

To add **TBarCode** to the *Custom Controls,* please follow the steps below:

- Click on *Controls* ► *Add or Remove Custom Controls…* (❶). A dialog will appear, which shows a list of installed custom controls.
- Click the *Add…* button ❷ to open the *"Add Custom Control Wizard"*.
- In Dialog "Control Type" choose *ActiveX Control* (❸), click *Next*.
- Locate and select *TBarCode11* in list ❹, then click *Next.*

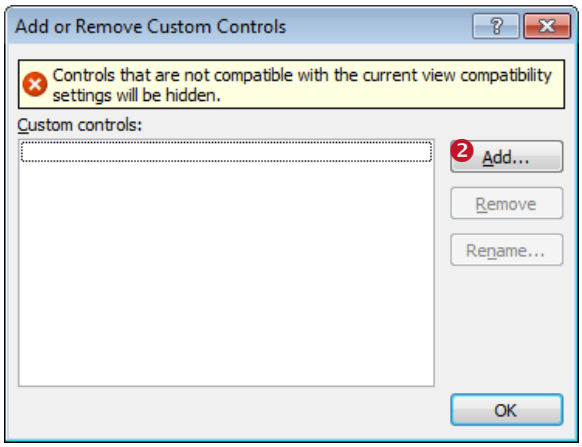


Figure 19: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (2)

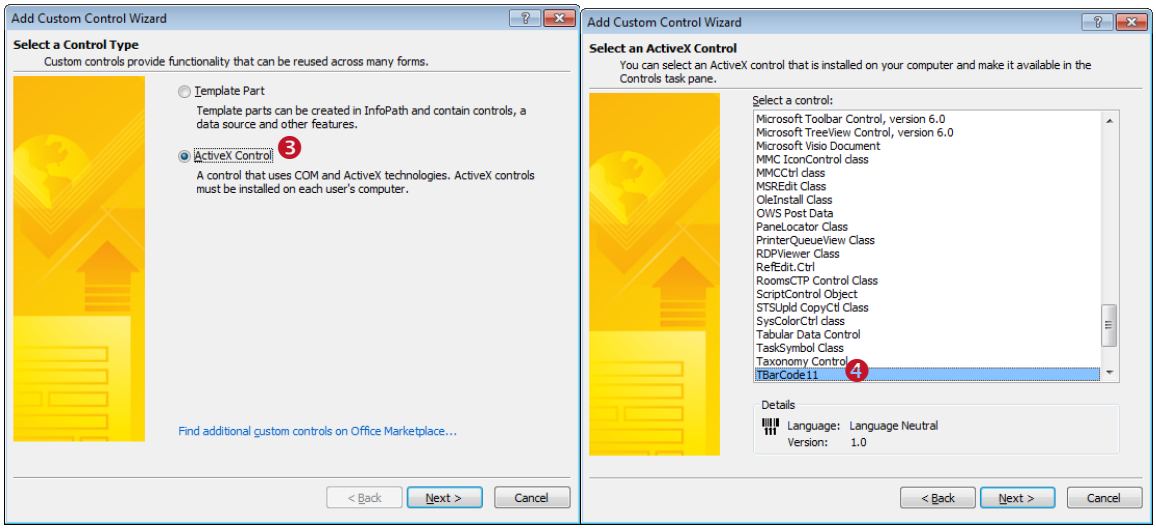

Add Custom Control Wizard
Select a Control Type
Custom controls provide functionality that can be reused across many forms.
Template Part
Template parts can be created in InfoPath and contain controls, a data source and other features.
ActiveX Control
3
A control that uses COM and ActiveX technologies. ActiveX controls must be installed on each user's computer.
Find additional custom controls on Office Marketplace...
< Back
Next >
Cancel
Add Custom Control Wizard
Select an ActiveX Control
You can select an ActiveX control that is installed on your computer and make it available in the Controls task pane.
Select a control:
Microsoft Toolbar Control, version 6.0
Microsoft TreeView Control, version 6.0
Microsoft Visio Document
MMC IconControl class
MMCCtrl class
MSREdit Class
OleInstall Class
OWS Post Data
PaneLocator Class
PrinterQueueView Class
RDPViewer Class
RefEdit.Ctrl
RoomsCTP Control Class
ScriptControl Object
STSUpld CopyCtl Class
SysColorCtrl class
Tabular Data Control
TaskSymbol Class
Taxonomy Control
TBarCode11
4
Details
Language: Language Neutral
Version: 1.0
< Back
Next >
Cancel

Figure 20: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (3)

- Choose whether you want to use a .cab file, click *Next*.
- On the following wizard pages you have to specify the data source type for **TBarCode.** This selection determines, how the barcode control can be used in InfoPath later on.
  For more information, please see below.

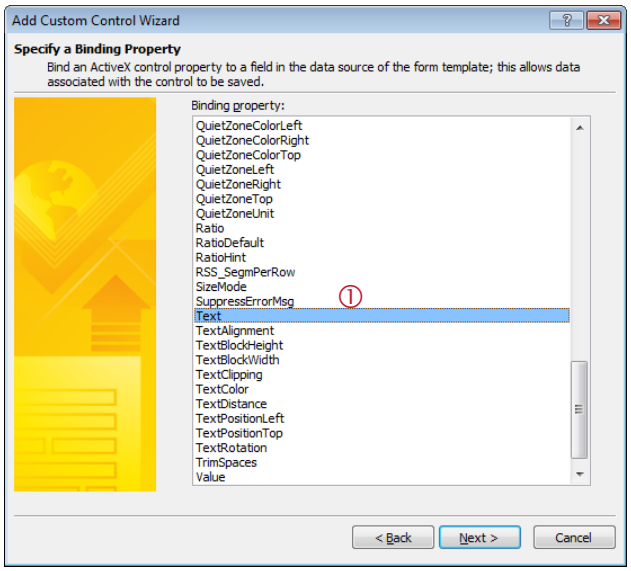
9.3.1.1 Specify Data Source Type

In the *"Add Custom Control Wizard"* you have to decide which kind of data you want to encode:

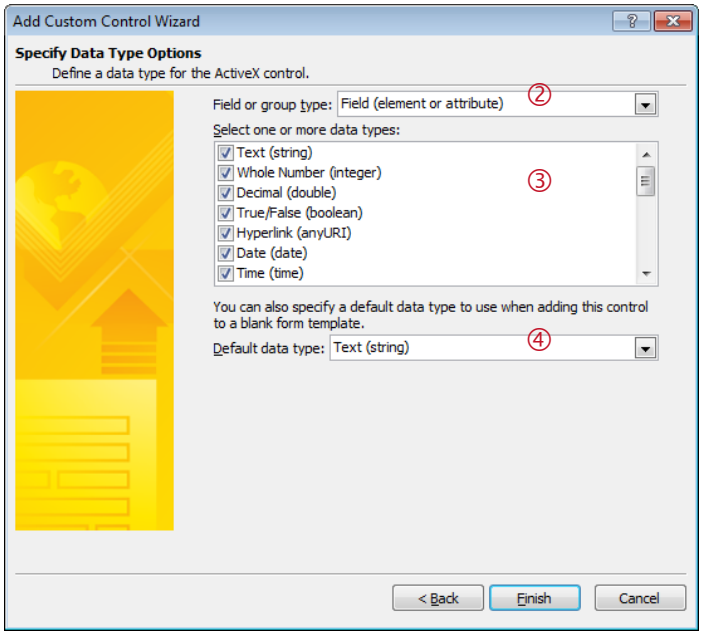
- If you plan to encode single data fields (e.g. the content of an input box), please follow the instructions in section 9.3.1.1.1.
- If you plan to encode the underlying InfoPath XML document (or parts of the XML document), please follow the instructions in section 9.3.1.1.2.

9.3.1.1.1 Encode Single Data Fields

Perform these steps if you plan to encode single data fields:



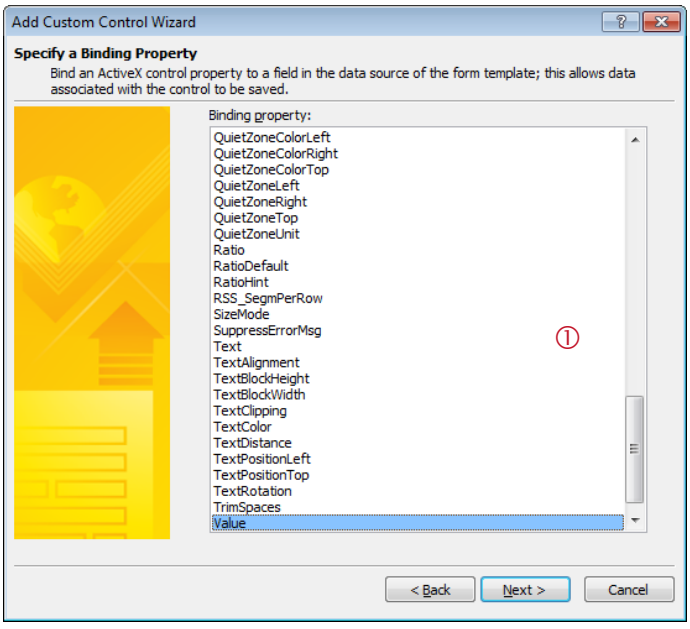
- Select the binding property *Text* (see ①).
- Click *Next.*
- On the next page *("Specify and Enable or Disable Property")* select the entry *Enabled*.
- Click *Next.*



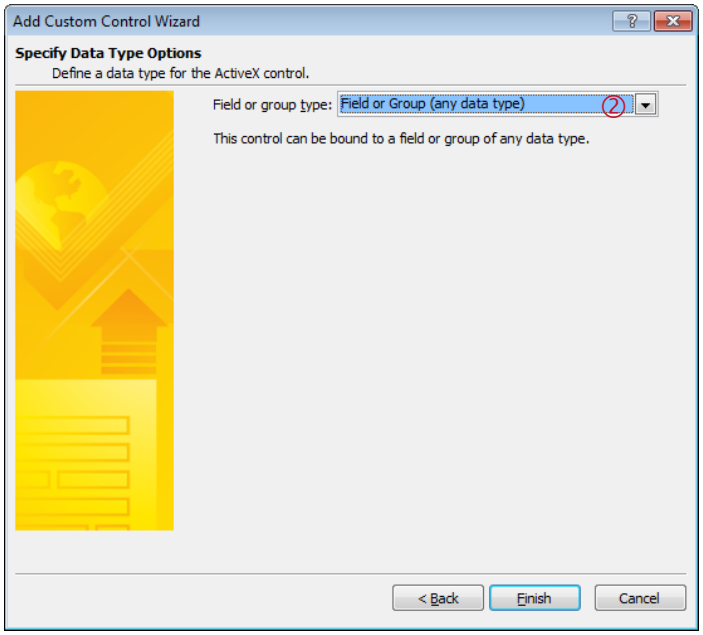
- In ② select *"Field (element or attribute)"*.
- Then select all data types (by clicking each single line in ③).
- Leave the default data type ④ as "*Text (string)*".
- Then click *Finish.*

9.3.1.1.2 Encode Complete or Partial Form Content (XML Data)

Perform these steps if you plan to encode XML data:



- Select the binding property *Value* (see ①).
- Click *Next.*
- On the next page *("Specify and Enable or Disable Property")* select the entry *Enabled*.
- Click *Next.*


Add Custom Control Wizard
Specify Data Type Options
Define a data type for the ActiveX control.
Field or group type:
Field or Group (any data type)
②
This control can be bound to a field or group of any data type.
< Back
Finish
Cancel

- In ② select *"Field or Group (any data type)"*.
- Then click *Finish.*

9.3.1.2 Finish Adding the Custom Control

- After you have completed the wizard, the **TBarCode** control will be listed in ❼.
- Click *OK* (❽).
- *TBarCode11* appears in the list of available controls (❾).

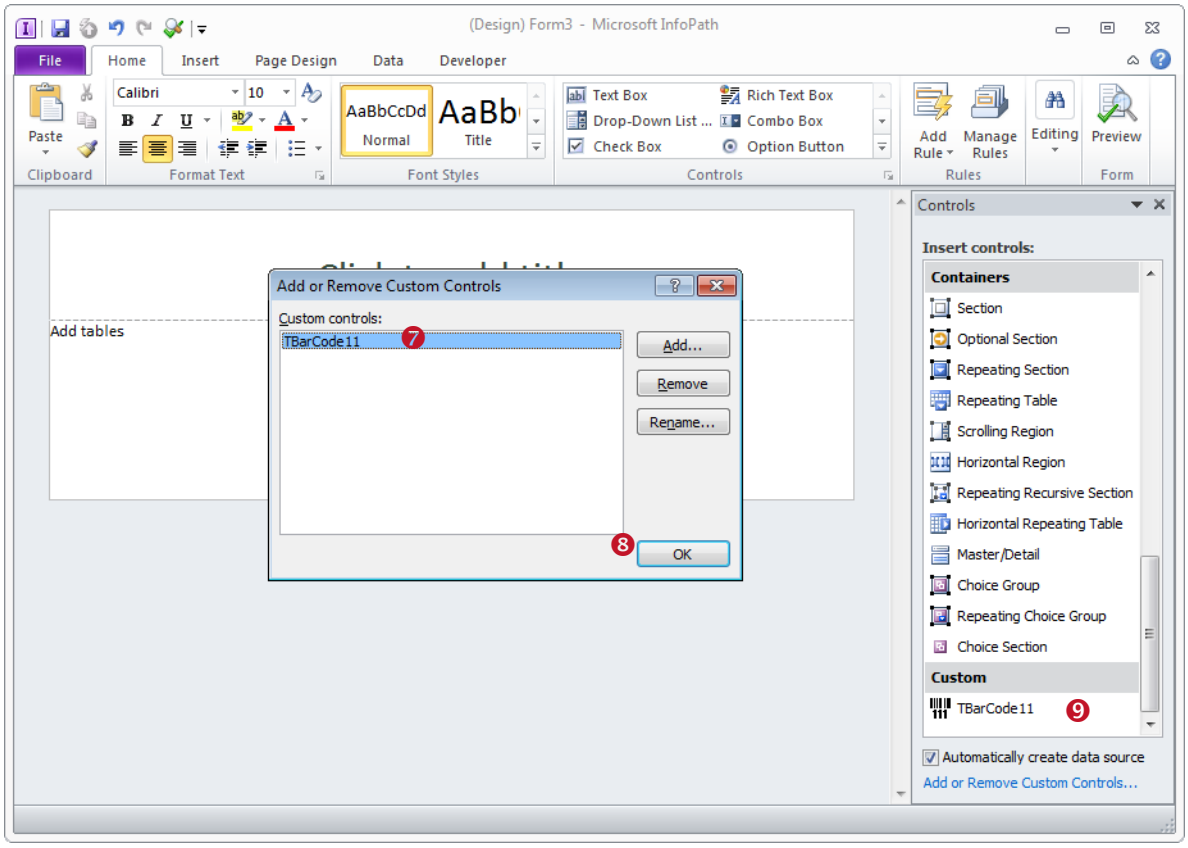


Figure 21: Add TBarCode to the Custom Controls in Microsoft InfoPath 2010 (4)

9.3.2 Insert Barcode

After you added **TBarCode OCX** to the *Custom Controls* in Microsoft InfoPath (see section 9.3.1) you can add a barcode to your document by performing the following steps:

- Place the cursor where you want to insert the barcode and click on the **TBarCode** control in the *Controls Pane* (❶).
- Before the barcode is actually inserted a dialog named *"TBarCode11 Binding"* appears.
- Select the required field ( ) or group ( ) as data source (see ❷). The content of the selected entry will be encoded as barcode.

> ► Please note:
> If you have selected single data fields as data source type (see 9.3.1.1.1) you can select fields only (no groups!).

- Press *OK.* A new barcode object will be inserted.

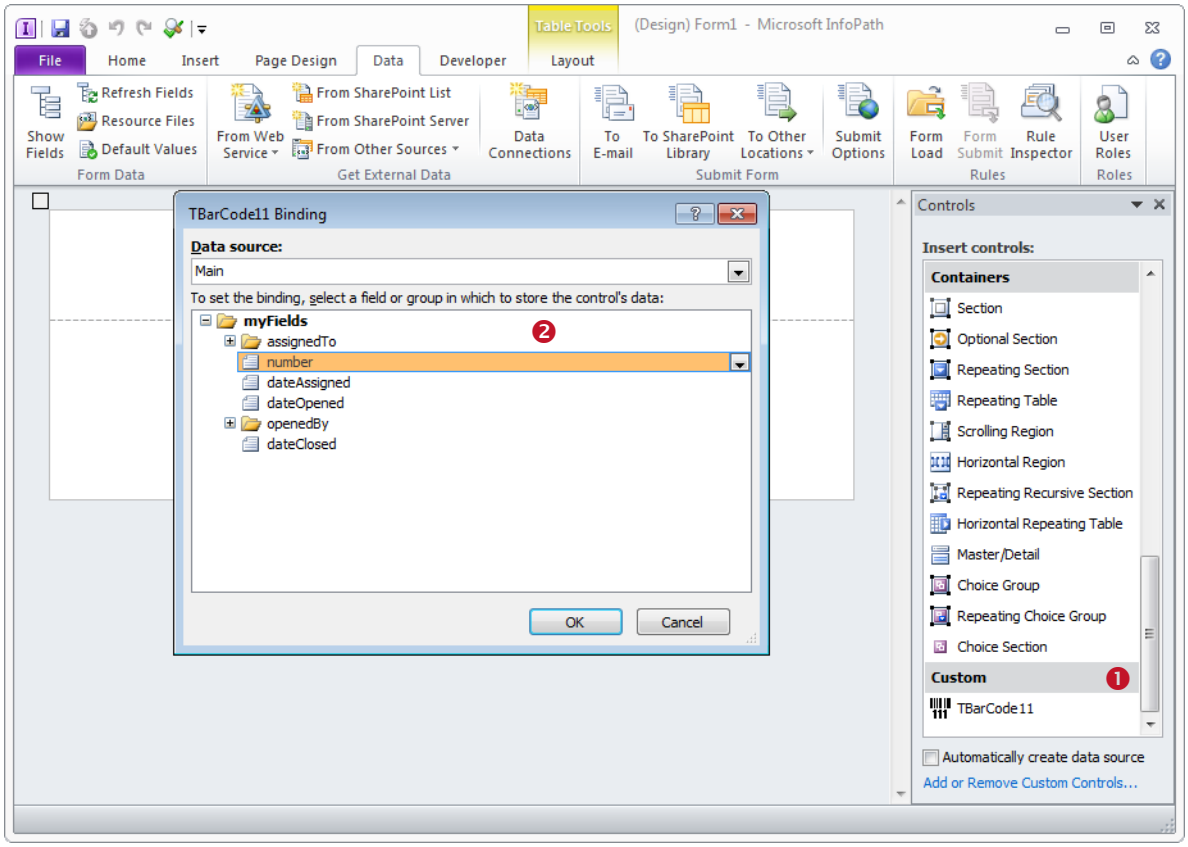
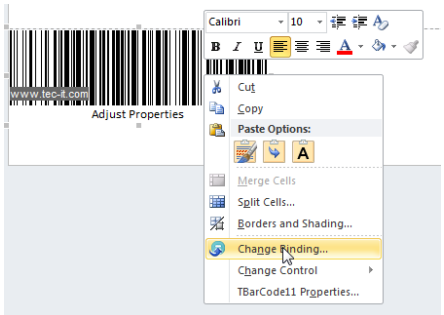


Figure 22: Insert TBarCode in a Microsoft InfoPath 2010 Document

9.3.3 Change Binding



To change the binding which was specified upon insertion of **TBarCode** (see Figure 22, ❷), right-click on the bar-code and select *Change Binding…* from the pop-up menu. The *"TBarCode11 Binding"* dialog appears.

Select a field (or group) from the tree view and confirm with *OK.*

9.3.4 Adjust Barcode Parameters

The barcode parameters can be adjusted using the *Property Pages* (a *Property List* is not available). Please open the property pages as follows:

- Right-click on the barcode object ❶.
- Select *TBarCode11 Properties…* from the pop-up menu (❷).
- The property pages ❸ will appear.

► For detailed information about the property pages and about the available settings, please refer to chapter 10.

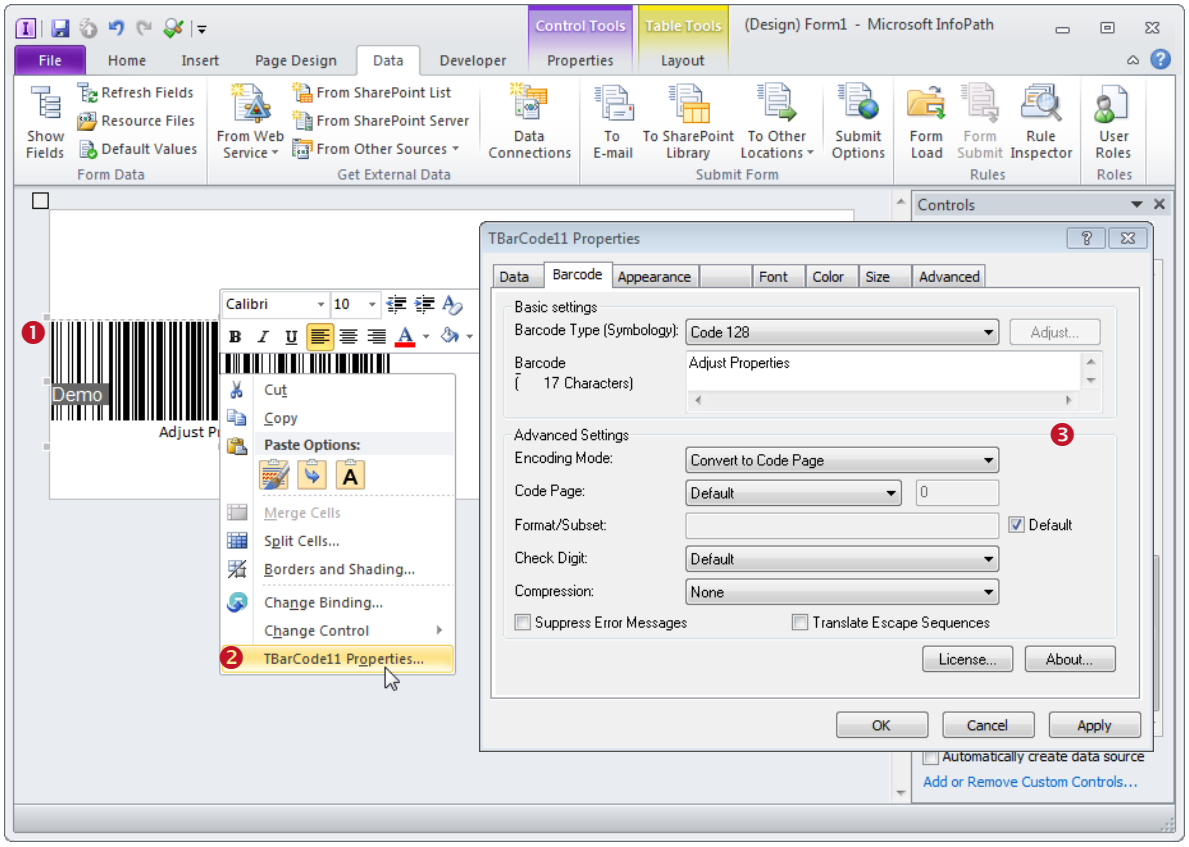


Figure 23: Adjust Barcode Properties in Microsoft InfoPath 2010

10 The Property Pages

10.1 Introduction

The property pages of **TBarCode** (and all settings which can be adjusted within the property pages) are described in detail below. See section 6.3.1 about opening the property pages.

10.2 Property Page "Barcode"

The first property page is the "Barcode" tab. It contains basic barcode adjustments like Barcode Type (Symbology), Barcode Data, etc. For most applications adjusting these settings will be sufficient. Additional parameters can be changed on demand (button *"Adjust…",* tabs *"Appearance", "Multiple Barcodes", "Font"* and *"Color").*

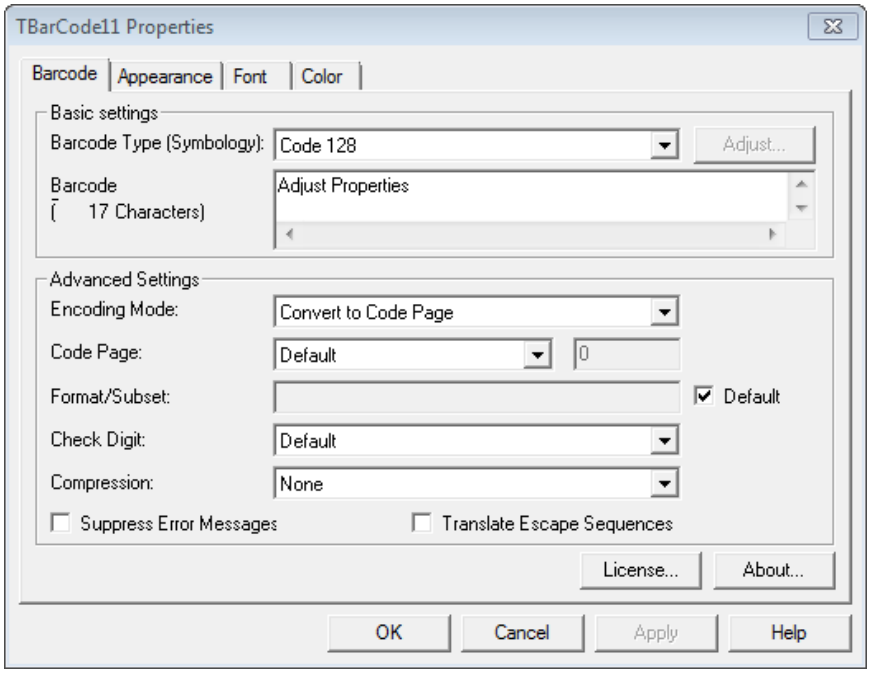


Figure 24: Property Page "Barcode"

10.2.1 Barcode Type (Symbology)

Select the barcode type that you want to create. Common linear barcode types are UPC (USA), EAN (Europe), Code 128, Code 39, 2 of 5 Interleaved. Common 2D barcode types are Data Matrix, PDF417, and QR-Code.

For information on the different barcode types (symbologies), please refer to the Barcode Reference (see Appendix A).

10.2.2 Button "Adjust…"

The *Adjust…* button will open a barcode specific properties dialog (for the selected barcode type / symbology). This button is available for 2D barcodes and for composite symbologies only!

Barcode specific settings are described in sections 10.6 to 10.16.

10.2.3 Barcode Data

The content of this textbox will be encoded as barcode. Depending on the selected barcode type you can encode different kinds of data:

- Some barcodes can be used to encode digits only.
- Others allow the usage of digits and a limited number of special characters like “/” or “*”.
- Again, others can be used to encode arbitrary alphanumeric data.

For more information on barcode types and on codeable data, please refer to the Barcode Reference (see Appendix A). The number of letters that the data currently contains is shown below *Barcode Data*.

> ► If the “Barcode Data” cannot be represented with the selected symbology, a big "X" is drawn instead of the barcode. Additionally an error code and a short error description are displayed.

10.2.4 Encoding Mode

The Encoding Mode specifies how the input data should be interpreted.

> ► Data is always passed as UNICODE stream to **TBarCode OCX**. As UNICODE characters always consist of 2 bytes and most of the barcode types are only able to encode one byte per character, it is not always clear how the input data should be interpreted. So we give you the possibility to decide yourself.
>
> ► Per default the input data is converted to the selected *Code Page* (see below). If other kinds of interpretations are needed, you have to change this property.

You have following possibilities:

Value	Description
Convert to Code Page	Converts the input data to the code page, which is selected in the property *Code Page.* (default)
No conversion (Lower bytes only)	Considers only the lower bytes of the input characters, the higher bytes are ignored.
Bytestream (Lower before higher byte)	The data is passed as it is. No conversion is done. Both bytes are considered. The lower byte is passed before the higher byte.
Bytestream Reverse (Higher before lower byte)	Consider both bytes but change the order of lower and higher byte. That means the higher byte is encoded before the lower byte.
As Hexadecimal Characters	Converts the input data, which **must** consist of hexadecimal values, to binary data. Pairs of hexadecimal values are converted to according byte values.

Table 1: Compression

10.2.5 Code page

The code page is related to the property *Encoding Mode*. It is only considered if the encoding mode is set to *Convert to Code Page*. You can choose among several pre-defined code pages (e.g. ANSI, ISO 8559-1 Latin I, UTF-8, Shift-JIS…) or add the ID of a custom code page.

10.2.6 Format/Subset

The format string is used for formatting the utilizable data of the barcode prior to encoding it.

The format string is built upon placeholders, which can be combined with constant data characters to build the final data string. Certain control characters make it possible to change the Subsets for Code 128, EAN 128 and UCC 128 or to define the desired start/stop character of CODABAR.

For detailed information on format strings, please refer to the Barcode Reference (see Appendix A).

10.2.7 Check Digit

Here you can change the calculation method of the check digit. Whether you need a check digit or not depends on your application and on the selected barcode type.

By default the appropriate check digit is selected automatically (entry *"Default"),* which means that the check digit is calculated according to the barcode specification. Any other suitable calculation method can be selected via the combo box.

Why check digits? In order to guarantee that the barcode data is read properly, a check digit is inserted (usually) at the end of the utilizable data. A comparison of the barcode content and the check digit informs the scanning device about the correctness of the scan. It causes the device to accept or to reject (repeat) the scan. The check digit calculation method is standardized for certain common barcodes.

- A change of the check digit method is admissible for special applications or for barcodes with selectable check digit methods only.
- For some barcodes the standard is no check digit. However, using a check digit is recommended (e.g. LOGMARS or Code39). You can use the combo box for enabling check digit calculation.

10.2.7.1 Check Digit Override

Some barcodes with a predefined number of utilizable data characters (like all EAN, UPC, Postnet and RSS-14 codes) include a check digit on a fixed position in the barcode data.

Example:

The EAN13 code permits 12 utilizable digits plus 1 check digit at the last position (❶).

If you enter 12 digits as barcode data this last digit (the check digit) will be calculated and inserted automatically. However, you can also enter all 13 digits and therefore override the calculated check digit.

- Note: If the check digit is supplied within the barcode data, the internal check digit calculation will be switched off.
- **TBarCode** does *not* check the correctness of the check digit supplied by your application.

"Check digit override" was primarily designed for use with article databases, in which the check digit is already included in the article numbers. However, the check digit override can also be used to calculate and to provide your own check digits (usually by program code) or to use all possible digits for utilizable data (in non-standard applications).

Under normal circumstances you should not use this feature – we recommend the automatic calculation of check digits by **TBarCode.**

10.2.8 Compression

To increment the capacity of barcodes you can compress the *"Barcode Data".* This means that the data provided by the user will be compressed before it is encoded as barcode.

The compression is only available for barcodes which allow the encoding of arbitrary binary data and a variable length of input data. By default the compression is set to *"None".*

Value	Description
None	The barcode data will not be compressed. It will be stored in the barcode as is (default).
Deflate (RFC 1951)	The barcode data will be compressed using the Deflate algorithm. We recommend using this algorithm if data compression is required.
GZip (RFC 1952)	The barcode data will be compressed using the GNU zip algorithm.
ZLib (RFC 1950)	The barcode data will be compressed using the ZLib algorithm.

Table 2: Compression

► Note: When reading compressed barcode data, you will have to decompress it in order to restore the original input data. Decompression can be done through the **TBarCode InForm** software decoder (which restores the uncompressed data automatically). – Or you can use any third party software library for decompression.

10.2.9 Suppress Error Messages

If the barcode data contains invalid characters (e.g. letters for code 2 of 5 Interleaved), or if the wrong number of input characters is provided, an error message is displayed (instead of the barcode).
If *"Suppress error message"* is enabled, this error message will be suppressed. Only blank space is displayed instead of any error information.

10.2.10 Translate Escape Sequences

Selects whether escape sequences (like \n) are translated or not (default: no).

The use of escape sequences is useful if you need to encode control characters such as Carriage Return or FNC1. For encoding binary data (e.g. Data Matrix) this feature may be very useful as well.

For more information on escape sequences, please refer to the Barcode Reference (see Appendix A).

10.2.11 Button "License…"

Opens the license dialog. For more information on how to license the product, please refer to chapter 11.

10.2.12 Button "About…"

Opens the about dialog. The *About* dialog shows the product version and copyright information to the user.

10.3 Property Page “Appearance”

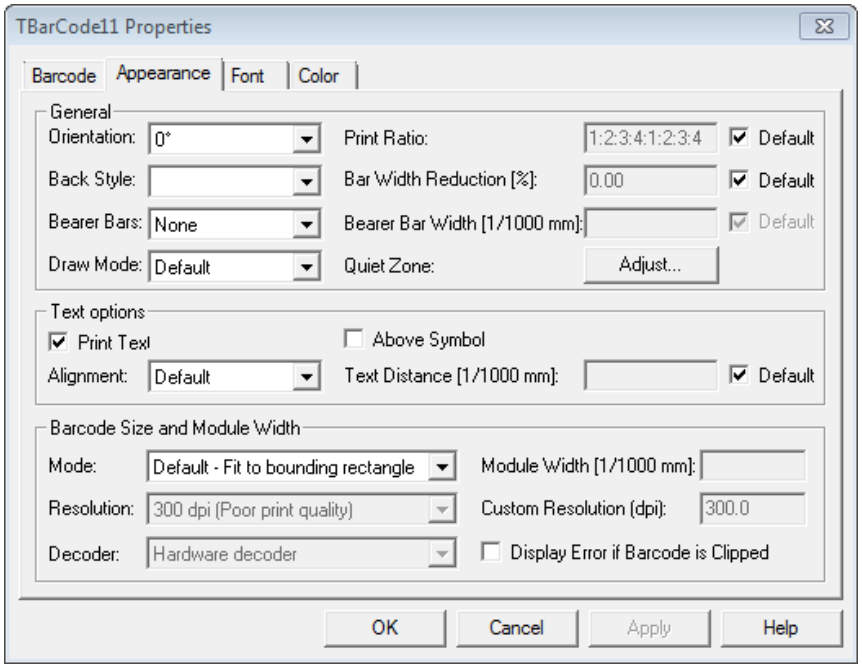


Figure 25: Property Page “Appearance”

10.3.1 General

10.3.1.1 Orientation

Specifies the orientation of the barcode. Selectable values are 0°, 90°, 180° and 270°. The barcode is rotated counter-clockwise.

> ► Please note: Some fonts (for the human readable text) do not support rotation (e.g. some bitmap fonts). If rotation is required we recommend selecting a TrueType® font.

10.3.1.2 Print Ratio

The print ratio is the relationship between the bar-widths and the space-widths of a barcode. Another term for print ratio is “bar width ratio” or “bar/space width ratio”.

> ► By default there is no need to change the print ratio, unless needed for any special application. – Please consider: Barcodes may become unreadable when manipulating this value!

The print ratio must be specified in a specific format. This format depends on the number of different bar- and space-widths used in the selected symbology.

Example: If a barcode element has 4 different bar widths and 4 different space widths, the print ratio looks like this (Code 128): 1:2:3:4:1:2:3:4. In the first part ("1:2:3:4") the width ratio of the bars is set, in the second part the relation of the spaces is set (in our case, they are the same). The smallest bar is "1" wide, the next larger is "2" wide (thus twice as wide as the smaller bar) and so on.

For more information on print ratios, please refer to the Barcode Reference (see Appendix A).

10.3.1.3 Back Style

The barcode can be painted with transparent background (default, background shines through) or with opaque background (background is drawn in the adjusted color).

► If the back style is set to *"Transparent",* the adjusted background-color will be ignored.

10.3.1.4 Bar Width Reduction [%]

Sets the bar width reduction in percent.

When printing on inkjet printers, the ink that is absorbed by the paper tends to diffuse. Setting the bar width reduction allows you to work against this spreading of ink. But also for laser printers with high toner saturation this property is useful.

The bar width reduction can be specified in percent of the module width. Thus when set to 20 all bars will be narrowed by 20 percent of the module width.

► Be careful: Setting the bar width reduction to more than 50 percent might leave the bar code unreadable! When using this feature we recommend you to do some test-scans to make sure that the bar code can be scanned correctly. A common value to start with is 15%.

10.3.1.5 Bearer Bars

Usually, bearer bars are used with the ITF-14 (or sometimes with the Interleaved 2 of 5) or the DPD symbology only. The bearer bars were introduced to equalize the pressure exerted by the printing plate over the entire surface of soft materials. They also enhance the reading reliability by helping to reduce the probability of misreads by skewed scanning beams.
For some types (like UPC and EAN) the bearer bars must be set to *"None".*

Value	Description
None	Do not print bearer bars.
Top and Bottom	Print bearer bars at the top and the bottom of the symbol.
Rectangle	Print bearer bars on all 4 sides of the symbol. For rectangular bearer bars, the quiet zone (see section 10.3.1.7) must be at least 12 times the module width. Otherwise no bearer bars will be printed.
Top	Print bearer bars at the top of the symbol.
Bottom	Print bearer bars at the bottom of the symbol.

Table 3: Bearer Bars

10.3.1.6 Bearer Bar Width [1/1000 mm]

Sets the width of the bearer bars in 1/1000 mm.

► The minimum width of the bearer bars is two times the module width (which is also used as default value). If any smaller value is entered, the minimum width will be used instead.

Note: If the bearer bar width is set to zero, no bearer bars are printed.

10.3.1.7 Draw Mode

Due to problems with certain printer drivers, **TBarCode** is able to use different methods to draw bar-codes. You can choose between following modes:

Value	Description
Default	The bar codes are drawn in the advanced mode. This provides the best quality.
Advanced	
Compatible	The bar codes are drawn in the compatible mode. This decreases the quality slightly, but is supported by the most printers.
Dual	The bar codes are drawn in the dual mode. This is a combination of the Advanced and Compatible mode.

Table 4: Draw Mode

If you want to use the “Compatible” draw mode as preferred setting you can specify this in an ini-file. For more information, please refer to Appendix B.

10.3.1.8 Quiet Zone

The quiet zone is an empty area outside the barcode. It helps the scanner to read the barcode correctly. Clicking the *Adjust…* button opens the following dialog:

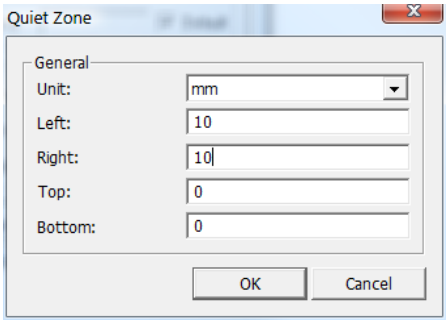


Figure 26: Quiet Zone Adjustment

In this dialog you adjust the quiet zone for all four sides of the barcode. Possible units are: Modules, Millimeters, Mils and Pixels. Default: No quiet zone is added.

For most 1D barcodes a quiet zone should be maintained directly before and after the barcode symbol. As a rule of thumb, the quiet zone should be ten times the dimension of the module width or at least 1/4 inch (6.5 mm). The exact value depends on the selected barcode type.

> ► Please note: A few barcode types provide the required quiet zone automatically. These barcodes are: EAN-8, EAN-13, UPC-A, UPC-E and ISBN. Changing the quiet zone for these symbologies will add an additional white space.

10.3.2 Text Options

The text options allow the adjustment of the human readable text. The human readable text is usually printed below the barcode symbol and shows the content of the barcode.

> ► Not all barcode specifications support the printing of human readable text. If human readable text is not supported, the following setting will be ignored.

10.3.2.1 Print Text

Specifies whether the barcode data is printed as human readable text or not. Default: Yes.

10.3.2.2 Above Symbol

Prints the human readable text above the symbol (default: below).

> ► For some barcodes, like UPC and EAN, the adjustment *“Above symbol”* is not permitted.

10.3.2.3 Alignment

Changes the alignment of the human readable text.

Value	Description
Default	Uses the default text alignment (= “Center”).
Left	Aligns the human readable text to the left.
Right	Aligns the human readable text to the right.
Center	Centers the human readable text.

Table 5: Text Alignment

10.3.2.4 Text Distance

Allows you to specify the distance between the human readable text and the barcode (in 1/1000 mm). If *"Default"* is marked, the minimum text distance is used. Otherwise the given value will be added.

10.3.3 Barcode Size and Module Width

10.3.3.1 Mode

This option selects the calculation method for the barcode size.

Value	Description
Default - Fit to bounding rectangle	Draws the biggest possible barcode which fits into the bounding rectangle. Resizing the bounding rectangle directly resizes the barcode.
Custom - Specify module width	Uses the specified module width for drawing the barcode (see section 10.3.3.2).
Minimal - Optimize for readability	Creates the smallest possible barcode for the selected “Resolution” (see section 10.3.3.3) and for the selected “Decoder” type (see section 10.3.3.5). Furthermore the module width of the barcode will be optimized for ensuring best readability.

Table 6: Size Mode

► Please note: The size modes *“Custom”* and *“Minimal”* influence the horizontal(!) size of a barcode only! The barcode height is always given by the height of its bounding rectangle. Only a few 2D barcodes, like Data Matrix, QR-Code or Composite symbologies require a fixed width to height ratio. For these barcodes the height will be calculated accordingly.

10.3.3.2 Module Width [1/1000 mm]

If the size mode is set to *“Custom – Specify module width”,* this input box lets you specify the size of one module (in 1/1000 mm).

A module is the smallest element of a barcode. The widths of all bars and spaces are multiples of one module width.

Sometimes the *“Module Width”* is also called *“Narrow Bar Width”.*

A constant module width is recommended if you have a varying amount of input data and if the optical data density should remain constant. Furthermore, some label specifications require a constant module width.

► Please note: When specifying a custom module width the barcode may grow bigger than the bounding rectangle for big module widths or for a large amount of input data. Please make sure that the bounding rectangle is wide enough to display the whole barcode symbol.
To ensure that no regions of the barcode are clipped, you can enable the option *“Display error if barcode is clipped”* (see section 10.3.4).

10.3.3.3 Resolution

The size mode *"Minimal - Optimize for readability"* requires the *"Resolution"* of the printer/scanner to be selected: As value select the lowest resolution, which is used within the chain of barcode processing (printing, scanning). Additionally you have to select the decoding solution from the *"Decoder"* combo box below. So it can be guaranteed that the printed barcode will be readable for the selected configuration.

Examples:

- If the barcode is printed with 600 dpi and then scanned with a hardware scanner, the resolution should be set to *"600 dpi (Good print quality)".* As decoder select *"Hardware".*
- If the barcode is printed with 600 dpi, transmitted with a fax device (200 dpi) and then scanned with a hardware scanner, the resolution should be set to *"200 dpi (Fax)".* As decoder select *"Hardware".*
- If the barcode is printed with a laser printer (600 dpi) and if it is then scanned with a flatbed scanner (150 dpi) and then decoded via software you should select a custom resolution of "150 dpi". As "decoder" select *"Software".*

Value	Description
96 dpi (Screen)	Specifies the default screen resolution.
200 dpi (Fax)	Specifies the default fax resolution.
202 dpi (Thermo transfer)	This resolution is used by thermo transfer printers (e.g. by Zebra® printers).
300 dpi (Poor print quality)	Specifies a low printer resolution.
600 dpi (Good print quality)	Specifies the standard printer resolution.
Custom dpi	Specifies any other resolution. The dpi value can be entered in the input box on the right (see section 10.3.3.4).

Table 7: Resolution

10.3.3.4 Custom Resolution (DPI)

Specifies the custom dpi value for the size mode *"Minimal - Optimize for readability"* if Resolution is set to *"Custom dpi".*

10.3.3.5 Decoder

Specifies, which kind of decoder is used for reading the barcode content (size mode *"Minimal - Optimize for readability").*

Value	Description
Both Hardware and Software	Select this option if you do not know which type of barcode decoder will be used. Based on the adjusted resolution (see section 10.3.3.4), TBarCode OCX will automatically choose a barcode size which can be read with both decoder types, Software and Hardware. ► If you are unsure about the resolution, we recommend a setting of 200 dpi (?). This should be readable in most cases.
Hardware	Select this option if the barcode is scanned (and decoded) via a scanning device (e.g. handheld scanner). This setting guarantees a minimal module width of 0.254 mm for linear barcodes and 0.5 mm for 2D barcodes. These values are recommended for most hardware scanners.
Software	Select this option if the barcode symbol is received as an image (e.g. via flat bed scanner, camera, fax software, etc.) and decoded via software solution. This setting guarantees a minimal module width of 5 pixels. This value ensures readability by most software decoders.
TBarCode InForm	Select this option if you plan to use the (upcoming) TBarCode software solution for decoding the barcode symbol.

Table 8: Decoder

10.3.4 Display Error if Barcode is clipped

For certain configurations, it is possible that the barcode grows bigger than the bounding rectangle. In this case all bars which extend the size of the bounding rectangle are clipped by default.

To make sure that the barcode does not remain unreadable (because of clipped regions), you can check the option *"Display error if barcode is clipped".* If this property is set, and if the barcode extends the size of the bounding rectangle, no barcode will be drawn at all. Instead an error is displayed.
This option may help you to avoid truncated barcodes; incorrect printouts can be detected immediately.

10.4 Property Page "Font"

In this menu you can adjust the font for the "human readable text".

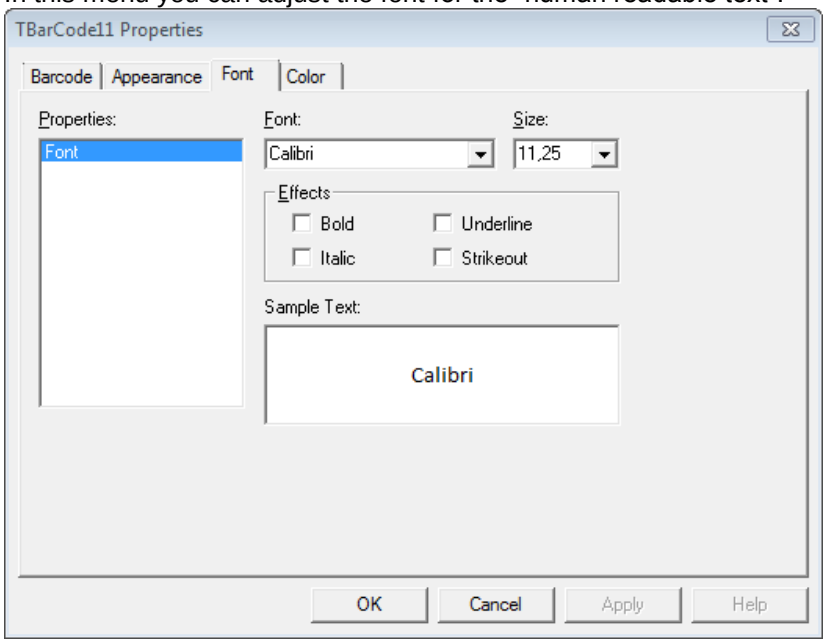


Figure 27: Property Page "Font"

10.4.1 Properties

The entry "Font" is pre-selected.

10.4.2 Font

Selects the font type. The combo box lists all fonts which are available under your operating system.

> ► Please consider that some fonts can't be rotated. Therefore, if rotation is required we recommend selecting a TrueType® font.

10.4.3 Size

Specifies the font size in points.

10.4.4 Effects

Applies additional text effects. Please, check the corresponding option to create bold, italic, underlined and/or stroked-out text.

10.4.5 Sample Text

Shows a preview of the selected font.

10.5 Property Page “Color”

The colors of the barcode, of the human readable text and of the background can be set here.

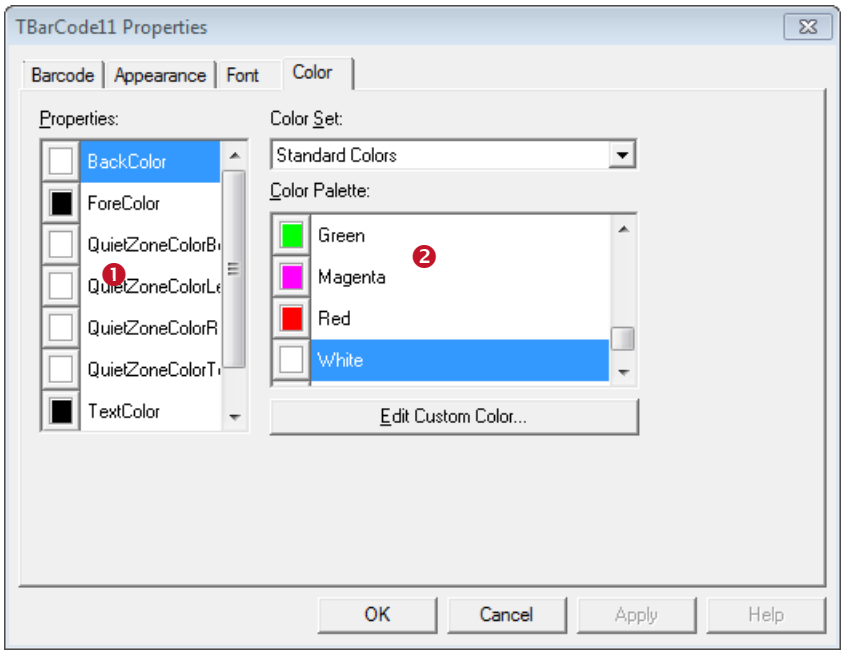


Figure 28: Property Page “Color”

In order to change the color for one of the barcode components (background, foreground, human readable text), you have to select the corresponding property in ❶ first. Then click on the desired color in ❷.

► Please note: The color in ❶ will only be updated when switching between the list entries.

10.5.1 Properties

Select the property that you want to change:

- BackColor
  The background color of the barcode (color of the spaces). If the back style is set to *“Transparent”,* the adjusted background-color will be ignored.
- ForeColor
  The foreground color of the barcode (color of the bars).
- TextColor
  The color of the human readable text.
- QuietZoneColorLeft
  The color of the quiet zone left of the barcode. If the back style is set to *“Transparent”,* the adjusted color will be ignored.
- QuietZoneColorBottom
  The color of the quiet zone below the barcode. If the back style is set to *“Transparent”,* the adjusted color will be ignored.
- QuietZoneColorRight
  The color of the quiet zone right of the barcode. If the back style is set to *“Transparent”,* the adjusted color will be ignored.

- QuietZoneColoTop
  The color of the quiet zone above the barcode. If the back style is set to *"Transparent"*, the adjusted color will be ignored.

10.5.2 Color Set

You can choose between *"Standard Colors"* and *"Windows System Colors"*. Each of these color sets offers a different color palette.

10.5.3 Color Palette

Clicking on one of the list entries assigns the color to the selected property.

10.5.4 Edit Custom Color…

Clicking this button opens a dialog which lets you select a color for the list entry <Custom…>. Alternatively you can also double-click on the <Custom…> list entry.

10.6 Adjust…

Depending on the selected barcode type **TBarCode** offers additional barcode specific adjustments. You can access these adjustments by clicking on the *Adjust…* button in the *"Barcode"* tab. This button is available for Aztec Code, Codablock-F, Data Matrix, DotCode, Han Xin Code, MaxiCode, MicroPDF417, PDF417, PDF417 Truncated, QR-Code, Micro QR-Code and all Composite Symbologies.

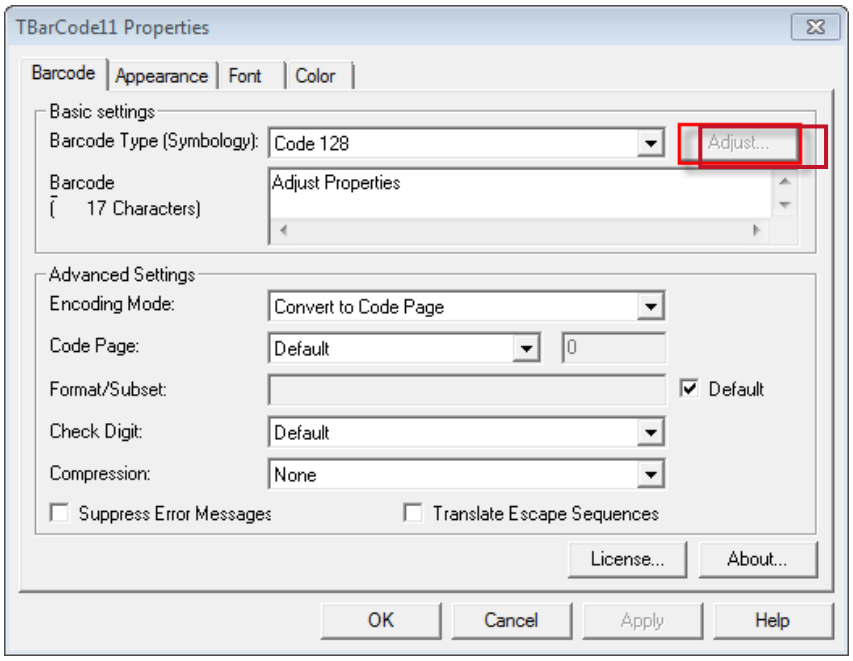


Figure 29: Adjust…

The following sections 10.7 to 10.16 will give an overview over barcode specific properties.

> ► Please take care when modifying these properties. Some settings may result in unreadable barcodes. Always make a test scan in case of doubt!

10.7 Adjust Properties: Aztec Code

Aztec Code is a 2-dimensional Matrix Code. Characteristic for the Aztec Code is the finder in the center of the symbol which contains of 3 to 5 lapping squares.

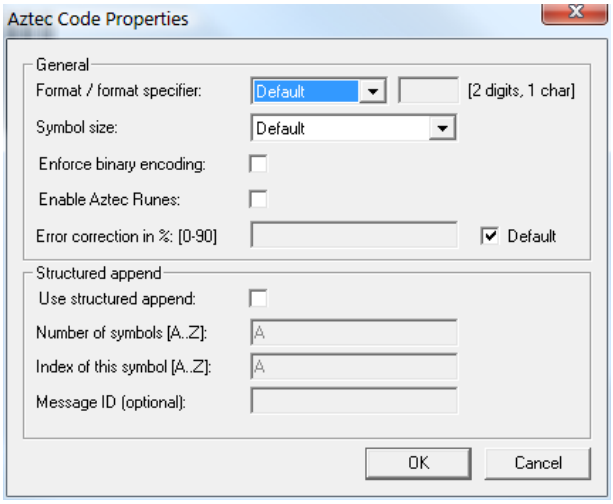


Figure 30: Advanced Properties: Aztec Code

10.7.1 Format / Format Specifier

You can choose from:

Value	Description
Default	The standard format of Aztec Code.
UCC/EAN	Special format defined by UCC and EAN. Used for encoding so-called Application Identifiers. FNC1 is added at first position.
Industry	For special industry formats. If you choose this value, you have to fill in a Format Specifier (2 digits or 1 letter). It determines which industry format the barcode data corresponds to. FNC1 is inserted at second position.

10.7.2 Symbol Size

Defines the size of the Aztec Code symbol. Possible values range from *"(1) 15 x 15"* to *"(33) 151 x* 151" modules. If the property is set to default, the size is computed automatically based on the length of the barcode data.

Additionally you can select one of three reader mode: 19x19 reader, 23x23 reader, 27x27 reader. These modes are often used to program the barcode scanners.

10.7.3 Enforce binary encoding

If checked binary mode is used for encoding (no input data analysis). This mode is recommended if you want to encode binary input data.

10.7.4 Enable Aztec Runes

The Aztec Runes mode is a special mode of the Aztec Code. You can encode only values between 0 and 255. Aztec Runes can be displayed in a very compact way and are highly readable due to Reed Solomon error correction.

10.7.5 Error Correction in % [0-90]

Unlike other barcode types the error correction level of an Aztec Code is not described in pre-defined levels but can be specified in percent of the data amount. Default error correction level is 23% (which is recommended), but it may be in the range from 0 up to 90%.

10.7.6 Structured Append

If you want to “connect” several Data Matrix symbols in order to encode larger quantities of data, you can use “Structured Append".

10.7.6.1 Use structured append

Activates structured append (symbol-chaining) with this option.

10.7.6.2 Number of all symbols [A…Z]

Enter the total number of chained Data Matrix symbols here. A maximum of 26 symbols may be used within one chain, where ***“A”*** stands for 1 and ***“Z”*** stands for 26.

10.7.6.3 Index of this symbol [1…16]

A symbol identification number – which is entered in the index field – must be assigned to each Data Matrix symbol. Its value can range from “A” (1) to “Z” (26). This index indicates the order in which the data is joined after the reading/scanning process.

10.7.6.4 Message ID

The Message ID has to be the same for all symbols within a chain.

10.8 Adjust Properties: Codablock-F

Codablock-F is a stacked symbology (like PDF417) based upon the Code 128 character set. Each row consists of a Code 128 symbol, but extended with row indicators (row count and sequence number) and an additional check digit.

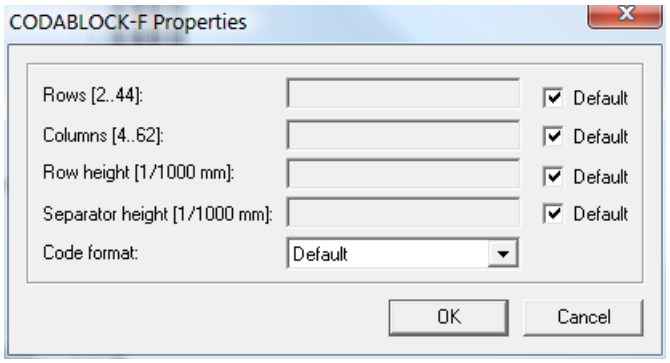


Figure 31: Advanced Properties: Codablock-F

10.8.1 Rows [2..44]

Specifies the number of rows used for encoding. The value must be between 2 and 44. Default: the number of lines is calculated automatically depending on the number of input characters.

10.8.2 Columns [4..62]

Defines the number of columns of the generated bar code. The value must be between 4 and 62. Start-, stop- and line-indicator columns, as well as code subset selectors are not taken into account.

Default: the number of columns is calculated automatically depending on the number of input characters.

10.8.3 Row height [1/1000 mm]

Sets the height of an individual row in 1/1000 mm. Default: The row height is calculated automatically.

10.8.4 Separator height [1/1000 mm]

Sets the height of the row separator in 1/1000 mm. Default: The height of the separator is calculated automatically.

10.8.5 Code format

You can choose one of the following formats:

Value	Description
Default	Standard format.
UCC/EAN	Special format defined by UCC and EAN to be used in UCC/EAN applications. Used for encoding so-called Application Identifiers (AIs). A FNC1 is encoded at first position automatically.

Table 9: Codablock-F Code Formats

10.9 Adjust Properties: Data Matrix

► Please note: **TBarCode** always encodes data using the newest ECC200 error correction method.

In this dialog you can set Data Matrix specific properties.

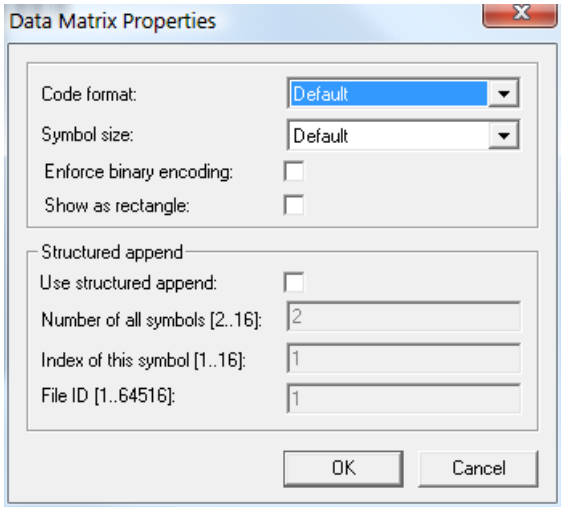


Figure 32: Advanced Properties: Data Matrix

10.9.1 Code Format

Sets the code format which is used for encoding the barcode data.

Value	Description
Default	The standard format of Data Matrix (no special header included).
GS1/UCC/EAN	Special format defined by GS1 for encoding Application Identifiers. This format adds the function character FNC1 at 1st position in the symbol.

Industry	This setting supports peculiar industry formats. It adds FNC1 at 2nd position.
Macro 05	*[)>Rs05Gs* is encoded at the beginning of the code.
Macro 06	*[)>Rs06Gs* is encoded at the beginning of the code.
Reader Programming	This setting activates the reader programming mode.
DP Postmatrix	Special format defined by “Deutsche Post”. A special finder pattern is drawn on the left side of the bar code.

Table 10: Data Matrix Code Formats

10.9.2 Symbol Size

Defines the size of the symbol in terms of rows and columns. Possible sizes are *"10 x 10"* to *"144 x 144"* modules for a square symbol and *"8 x 18"* to *"16 x 48"* for a rectangular symbol. When set to default the minimal square size is used (depending on input data).

10.9.3 Enforce Binary Encoding

If checked binary mode is used for encoding (no input data analysis). This mode is recommended if you want to encode binary input data.

10.9.4 Show as Rectangle

Determines if the Data Matrix symbol should be displayed as rectangle (checked) or square (unchecked – default).

10.9.5 Structured Append

If you want to “connect” several Data Matrix symbols in order to encode larger quantities of data, you can use “Structured Append".

10.9.5.1 Use structured append

Activates structured append (symbol-chaining) with this option.

10.9.5.2 Number of all symbols [2…16]

Enter the total number of chained Data Matrix symbols here. A maximum of 16 symbols may be used within one chain.

10.9.5.3 Index of this symbol [1…16]

A symbol identification number – which is entered in the index field – must be assigned to each Data Matrix symbol. Its value can range from 1 to 16. This index indicates the order in which the data is joined after the reading/scanning process.

10.9.5.4 File-ID [1…64516]

The File ID has to be the same for all symbols within a chain.

10.10 Adjust Properties: DotCode

DotCode is a 2D dot code symbology, which means that 2 dots are always separated by at least on space.

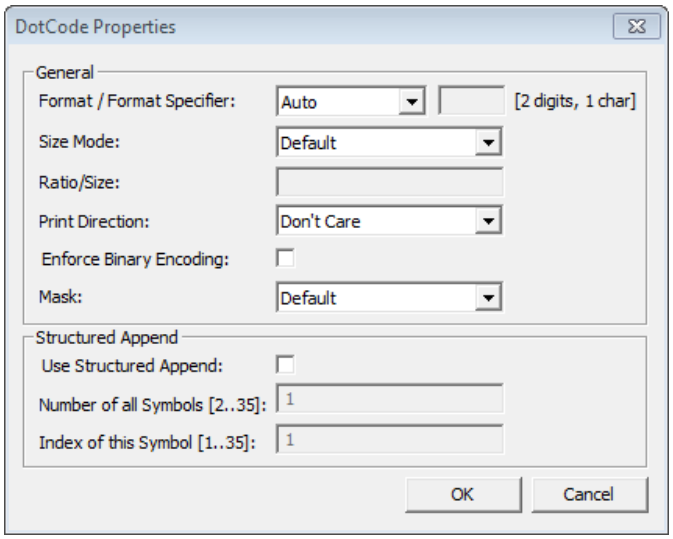


Figure 33: Advanced Properties: DotCode

10.10.1 Format / Format Specifier

You can choose from:

Value	Description
Auto	Auto discriminate between UCC/EAN/GS1 format and generic format. If the data starts with 2 digits data is handled as GS1 format, otherwise it is handled as generic format.
Generic	Data is handled as generic format. If it starts with 2 digits FNC1 is added on first position.
GS1/UCC/EAN	Special format defined by GS1. Used for encoding so-called Application Identifiers. FNC1 is added at first position.
Industry	For special industry formats. If you choose this value, you have to fill in a Format Specifier (2 digits or 1 letter). It determines which industry format the barcode data corresponds to. FNC1 is inserted at second position.
Macro 05	*[)>Rs05Gs* is encoded at the beginning of the code.
Macro 06	*[)>Rs06Gs* is encoded at the beginning of the code.
Macro 12	*[)>Rs12Gs* is encoded at the beginning of the code.
Custom Macro	*[)>Rs* is encoded at the beginning of the code. The rest has to be added by the user.
Reader Programming	This setting activates the reader programming mode.

Table 11: DotCode Formats

10.10.2 Size Mode

The Size Mode specifies either the *Ratio between Height and Width*, or the number of rows (*Fixed Height*) or columns (*Fixed Width*). Default specifies a ratio of 4:3.

10.10.3 Ratio/Size

Depending on the Size Mode this setting defines either the aspect ratio (width : height) or the number of columns or rows.

10.10.4 Print Direction

Set the print direction for which the DotCode symbol is to be optimized, regarding the robustness of the symbol. It has only effect, if Size Mode is either *Default* or *Ratio Width/Height*.

10.10.5 Enforce Binary Encoding

If checked binary mode is used for encoding (no input data analysis). This mode is recommended if you want to encode binary input data.

10.10.6 Mask

Selects the mask pattern, which is applied to the encoded data (XOR masking). The goal of the mask pattern is to distribute the bar-space transitions evenly over the symbol in order to improve the readability of the barcode.

Value	Description
Default	Selects the mask pattern automatically (recommended).
0..3	Selects one of the mask patterns (0 to 3) manually. Manual selection may be useful, if you want to generate many symbols within minimal computation time. The algorithm for identifying the optimal mask automatically is complex (and resource consuming). However, the readability of the barcode may suffer when using manual selection.

Table 12: DotCode Mask Patterns

10.10.7 Structured Append

10.10.7.1 Use Structured Append

Activates structured append (symbol-chaining) with this option.

10.10.7.2 Number of all Symbols [2…35]

Enter the total number of chained DotCode symbols here. A maximum of 35 symbols may be used within one chain.

10.10.7.3 Index of this Symbol [1…35]

A symbol identification number – which is entered in the index field – must be assigned to each DotCode symbol. Its value can range from 1 to 35. This index indicates the order in which the data is joined after the reading/scanning process.

10.11 Adjust Properties: Han Xin Code

Han Xin Code is a 2D matrix code like Data Matrix and QR-Code. It implements special support for Chinese characters (character set *GB18030*), but supports also western character sets (like Latin I) and byte encoding.

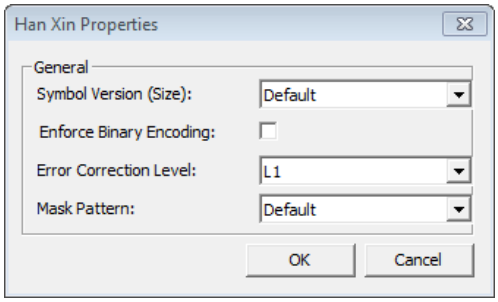


Figure 34: Advanced Properties: Han Xin Code

10.11.1 Symbol Version (Size)

Defines the version (=size) of a symbol. Possible sizes are *"Version1 (23 x 23)"* to *"Version 84 (189 x 189)"*. When set to default the minimal square size for given input data is used.

10.11.2 Enforce Binary Encoding

If checked binary mode is used for encoding (no input data analysis). This mode is recommended if you want to encode binary input data.

10.11.3 Error Correction Level

Defines the error correction level.

Value	Description
L1	Lowest level (Default). Data recovery capacity is approximately up to 8%.
L2	Up to 15%
L3	Up to 23%
L4	Highest level. Up to 30%

Table 13: Han Xin Code Error Correction Levels

10.11.4 Mask Pattern

Selects the mask pattern, which is applied to the symbol matrix (XOR masking). The goal of the mask pattern is to distribute the bar-space transitions evenly over the symbol in order to improve the readability of the barcode.

Value	Description
Default	Selects the mask pattern automatically (recommended).
0..3	Selects one of the mask patterns (0 to 3) manually. Manual selection may be useful, if you want to generate many symbols within minimal computation time. The algorithm for identifying the optimal mask automatically is complex (and resource consuming). However, the readability of the barcode may suffer when using manual selection.

Table 14: Han Xin Code Mask Patterns

10.12 Adjust Properties: MaxiCode

MaxiCode represents data by drawing hexagonal items which are arranged around a circular center (bull's eye). The internal data structure is regulated by different modes. The "Structured Carrier Message" mode was defined by the United Parcel Service UPS®. Data can be encoded with two different error correction levels: SEC (= Standard Error Correction) and EEC (= Enhanced Error Correction).

MaxiCode is very flexible. With structured append you can divide larger quantities of data into several MaxiCode symbols – they are then re-joined by the scanner.
The maximum data capacity of one symbol is 93 characters. The actual quantity of the utilizable data depends on the selected mode, the number of special characters, and whether numeric sequences are used or not (numeric sequences can be encoded using less space than ASCII data). Last but not least the error correction level influences data capacity.

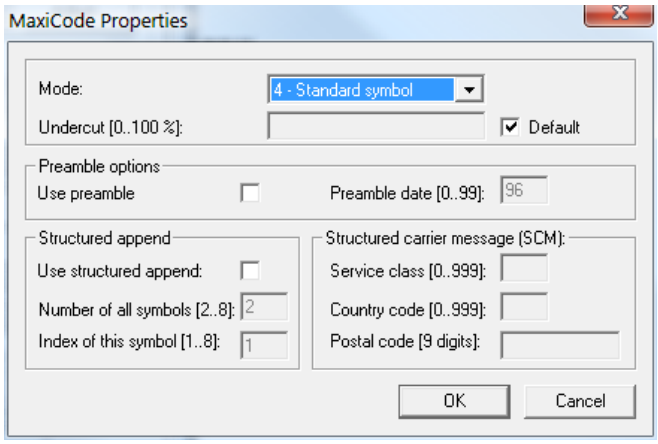


Figure 35: Advanced Properties: MaxiCode

10.12.1 Mode

Selects the mode for the actual symbol. Default: Mode 4.

Value	Description
Default	Is equal to Mode 4
Mode 2	SCM Numeric ► Structured Carrier Message with 9 digits Postal Code (digits only)
Mode 3	SCM Alphanumeric ► Structured Carrier Message with up to 6 characters Postal Code (alphanumeric characters)
Mode 4	No SCM, encoding of numeric and alphanumeric characters (incl. Standard Error Correction)
Mode 5	Full EEC – like mode 4 but with maximum error correction (safer, but less data possible)

Table 15: MaxiCode Compaction Modes

10.12.2 Undercut [0..100 %]

The undercut influences the diameter of the hexagonal barcode elements. In new applications it is recommended (according to the AIM standard) to use an undercut setting of 75% (default).

10.12.3 Preamble Options

Used in particular open system standards. Under *"Preamble date"* the last two digits of a year can be entered. They are automatically inserted into the data stream in a predefined place.
The preamble can also be specified by escape sequences in the *"Barcode data"* (alias *Text* property). To learn more about this option please refer to the Barcode Reference (see Appendix A).

10.12.3.1 Use Preamble

Enables the preamble mode if checked.

10.12.3.2 Preamble date (0…99)

This is the value of the preamble year to be encoded in the MaxiCode symbol.

10.12.4 Structured Append

Structured append is used for appending multiple MaxiCode symbols to one chain. Therefore some additional header information (total number of barcodes, index) will be included in the barcode symbol.
Using structured append, a large amount of input data which is split up into multiple barcode symbols can be re-joined correctly, even if the barcodes are read in the wrong order.

10.12.4.1 Use structured append

Activate this option if structured append should be activated.

10.12.4.2 Number of all symbols [2…8]

The total number of MaxiCode symbols must be specified in this field.

10.12.4.3 Index of this symbol [1…8]

The symbol identification number (index) can be assigned to each MaxiCode symbol. Its value can range from 1 to 8. The index is used for identifying the correct re-joining order.

10.12.5 Structured Carrier Message (SCM)

MaxiCode was originally developed by UPS® (United Parcel Service). The operating modes 2 and 3 (Structured Carrier Message) provide the additional data-fields *Service Class, Country Code* and *Postal Code.*

These fields can also be specified by escape sequences in the *"Barcode data"* (alias *Text* property). For more information, please refer to the Barcode Reference (see Appendix A).

10.12.5.1 Service class [0...999]

Specifies the service class (used with within the SCM - mode 2 or 3).

10.12.5.2 Country code [0...999]

Specifies the country code (used with within the SCM - mode 2 or 3).

10.12.5.3 Postal code [9 digits]

Specifies the postal-code (used with within the SCM - mode 2 or 3).

- Mode 2: up to 9 digits can be specified.
- Mode 3: up to 6 characters (digits and uppercase letters) can be specified.

10.13 Adjust Properties: PDF417

PDF417 divides data content into graphical rows and columns. It is a so-called "stacked symbology". This property page allows you to change specific settings for PDF417, PDF417 Truncated and MicroPDF symbologies.

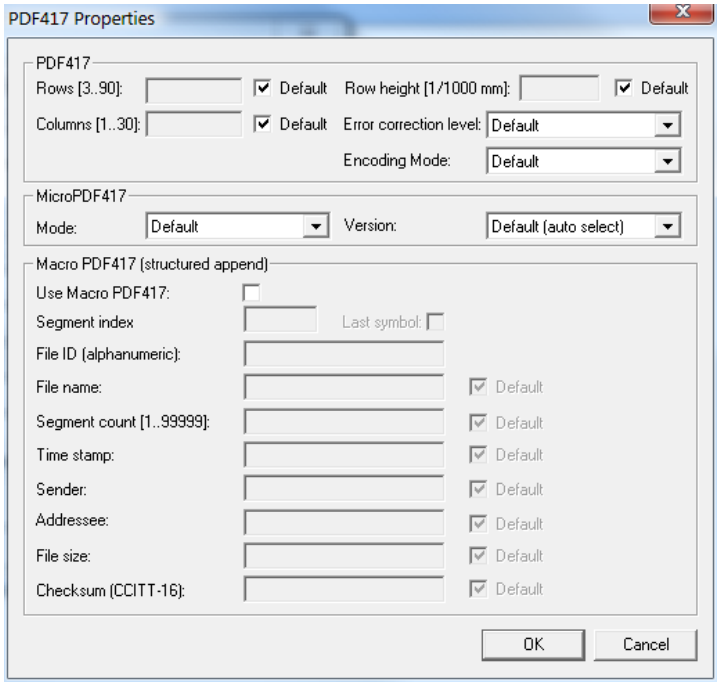


Figure 36: Advanced Properties: PDF417

> ► Please take care when modifying these properties. Some settings may result in unreadable barcodes. Always make a test scan in case of doubt!

10.13.1 PDF417

These settings apply for all PDF417 based barcodes (PDF417, PDF417 Truncated, and MicroPDF417).

10.13.1.1 Rows [3..90]

Specifies the number of rows of one PDF417 symbol. Values between 3 and 90 are allowed.

Default: the number of lines (rows) is calculated automatically depending on the amount of input data.

10.13.1.2 Row height [1/1000 mm]

Sets the height of an individual row in 1/1000 mm.

Default: the row height is calculated automatically depending on the bounding rectangle and the number of rows.

Some label specifications require a specific ratio between module width and row height.
Example: If a ratio of 1:3 is required you might set the module width to 254 and the row height to 762.

10.13.1.3 Columns [1..30]

Defines the number of columns of a PDF417 symbol. Values between 1 and 30 are allowed. The start-, stop- and line-indicator columns (which are fixed parts of the symbol) are not taken into account.

Default: the number of columns is calculated automatically depending on the number of input characters.

► You should not set both rows AND columns to a constant value!

10.13.1.4 Error Correction Level

Sets the error correction level. Values between 0 and 8 are allowed.

The error correction level defines the number of code words which are used for error recognition/ correction. Each PDF417 barcode contains at least two code words:
Level 0: 2 code words. Level 1: 4 code words. Level 2: 8 code words. And so on: Levels 3 to 7 are using 16, 32, 64, 128 and 256 code words. Level 8 uses 512 code words for error correction.

Value	Description
Default	Depending on the amount of input data the error correction level is set to a value between 2 and 5 automatically.
0	Error recognition only (no error correction is possible). 2 code words are used for calculating a check sum.
1	Error correction. 4 code words are used for error correction information.
2	Error correction. 8 code words are used for error correction information.
:	:
8	Error correction. 512 code words are used for error correction information.

Table 16: PDF417 Error Correction Levels

A higher error correction level adds more redundant information to the symbol. Therefore the symbol will require more space for printing. If the symbol is distorted through surface damage, bad printing quality or dirt the error correction information can help to reconstruct the full information contained in the PDF symbol (reconstruction is done by the scanner).

► The error correction algorithm (Reed Solomon) has the following limit for a successful reconstruction of data: ([total number of not decodable characters] + 2 * [number of read errors]) must be smaller than ([number of error correcting code words] - 2).

10.13.1.5 Encoding Mode

Choose the encoding mode of the barcode.

Value	Description
Normal (Default)	Analyzes the input data. Depending on the input data either “text”, “numeric” or “binary compaction” mode is used in order to keep the resulting symbol as small as possible.
Binary Compaction	Uses binary mode for encoding (no input data analysis). This mode is recommended if you want to encode binary input data.

10.13.2 MicroPDF417

These settings apply for the MicroPDF417 symbology only.

10.13.2.1 Mode

Specifies how data is encoded when using Micro PDF417. In most cases the *“Default”* or the *“Binary”* mode is the best choice. Some decoders may not support all modes listed here. – Please, check with your scanner first.

Value	Description
Normal (Default)	Analyzes the input data. Depending on the input data either “text”, “numeric” or “binary compaction” mode is used in order to keep the resulting symbol as small as possible.
UCC/EAN-128 Emulation	UCC/EAN-128 emulation mode. Transmit]C1 or]L3. Use compaction for Application Identifier (AI) "01" + 14 digits.
Code128 Emulation	Code-128 emulation mode. Transmit]C2 or]L4.
Code128 FNC2 Emulation	Code-128 with FNC2 on first position will be emulated.
Linked UCC/EAN-128	Linked UCC/EAN-128 emulation. Transmit]C1 or]L3. This mode links the MicroPDF symbol with a linear (1D) symbol. The linked symbol may be required for a successful scan. The symbol can be encoded with better compaction when using one of the following orders for Application Identifiers (AIs): ▪ date (AI 11, 13, 15 or 17) + lot number (AI 10) + other AIs (optional). ▪ date (AI 11, 13, 15 or 17) + serial number (AI 21) + other AIs (optional). ▪ date (AI 11, 13, 15 or 17) + other AIs (optional). Note: This mode is not used with UCC/EAN Composite Symbology, which uses linked symbols as well.
05 Macro	The preamble [(> RS 0 5 GS precedes the barcode data.
06 Macro	The preamble [(> RS 0 6 GS precedes the barcode data.
CC-A Data Mode	Uses Base-928 compaction and processes input data as byte array.
CC-B Data Mode	Uses binary compaction (Base-900). The barcode data is prefixed with a reserved code word.

Table 17: Micro PDF417 Compaction Modes

10.13.2.2 Version

Specifies the size of the symbol in terms of codeword columns and MicroPDF417 rows.

10.13.3 Macro PDF417 (structured append)

Macro PDF417 is used for connecting multiple PDF417 symbols (PDF417, PDF417 Truncated or MicroPDF417) into one chain. For each symbol of the chain you can specify

- the “Segment Index” of the actual symbol
  (“Last symbol” specifies, that the actual symbol is the last symbol in the chain),
- the “File ID” (which identifies one chain of symbols),
- optional information:

- File name
- Segment count
- Time stamp
- Sender
- Addressee
- File size
- Checksum (CCITT-16)

10.14 Adjust Properties: QR-Code / QR-Code 2005

The QR-Code is a 2-dimensional matrix symbology (like Data Matrix). It has a remarkable data capacity of up to 3000 ASCII characters or 7000 digits. The QR-Code symbology was designed to read a lot of data within a minimum of time (QR-Code means Quick Response Code).

QR-Code 2005 is a variant of QR-Code, which supports a default data encoding of Latin-1 instead of Kanji (Japanese character set) and is commonly used in Europe.

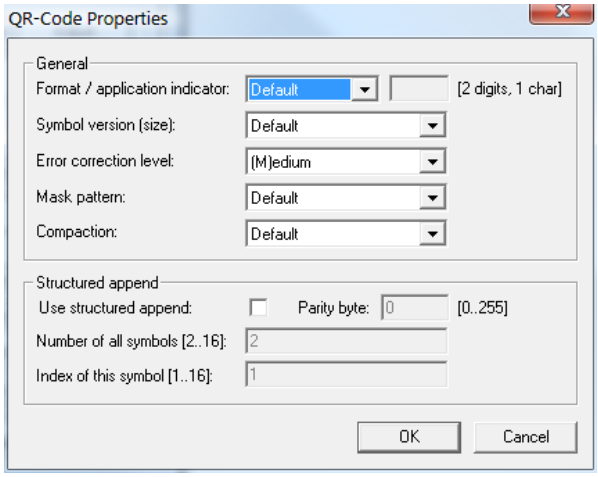


Figure 37: Advanced Properties: QR-Code

10.14.1 Format / Application Indicator

You can choose from:

Value	Description
Default	The standard format of QR-Code.
UCC/EAN	Special format defined by UCC and EAN. Used for encoding so-called Application Identifiers. FNC1 is added at first position.
Industry	For special industry formats. If you choose this value, you have to fill in an Application Indicator (2 digits or 1 letter). It determines which industry format the barcode data corresponds to. FNC1 is inserted at second position.

Table 18: QR-Code Formats

10.14.2 Symbol Version (Size)

Defines the version (= size) of the QR-Code symbol. Possible values range from *"(1) 21 x 21"* to *"(40) 177 x 177"* modules. If the property is set to default, the size is computed automatically based on the length of the barcode data.

10.14.3 Error Correction Level

Defines the error correction level.

Value	Description
(L)ow	Lowest level. Data recovery capacity is approximately up to 7%.
(M)edium	Up to 15%
(Q)uartil	Up to 25%
(H)igh	Highest level. Up to 30%

Table 19: QR-Code Error Correction Levels

10.14.4 Mask Pattern

Selects the mask pattern, which is applied to the barcode symbol (XOR masking). The goal of the mask pattern is to distribute the bar-space transitions evenly over the symbol in order to improve the readability of the barcode.

Value	Description
Default	Selects the mask pattern automatically (recommended).
0..7	Selects one of the mask patterns (0 to 7) manually. Manual selection may be useful, if you want to generate many symbols within minimal computation time. The algorithm for identifying the optimal mask automatically is complex (and resource consuming). However, the readability of the barcode may suffer when using manual selection.

Table 20: QR-Code Mask Patterns

10.14.5 Compaction

QR-Code can compact dedicated Multi Byte character sets from 16 bit representation into 13 bit encoding. This property enables the compaction of Kanji or Simplified Chinese characters into 13-bit values.

ActiveX controls are using the Unicode™ character set. Depending on the *Code Page* property, the Unicode input is converted to the corresponding encoding.

If you use one of the available compaction modes, please make sure that the Unicode input is converted to either Shift JIS X 0208 (Kanji) or GB2312 (Simplified Chinese). Also make sure that your decoder (scanner) can deal with these compaction modes.

Value	Description
Default	Default multi byte character compression. Depends on specified *Code Page*.
None	No multi byte character compression.
Kanji compaction	Enables Kanji character compaction. Input data must be supplied in Multi Byte character set Shift JIS X 0208 (see *Code Page).* Compaction of Kanji characters is done according to ISO/IEC 18004 (and AIM ITS/97-001) specification.
Chinese compaction	Enables Chinese character compaction. Input data must be supplied in Multi Byte character set GB2312 (see *Code Page).* Compaction of Chinese characters is done according to GB/T 18284-2000). Please note that this compaction mode is not supported by all decoders.

Table 21: QR-Code Compaction Modes

10.14.6 Structured Append

If you want to connect several QR-Code symbols (for encoding larger quantities of data) you can use structured append.

10.14.6.1 Use Structured Append

Activates structured append (symbol-chaining).

10.14.6.2 Parity Byte [0…255]

Chained QR-Code symbols are identified by the parity byte. The parity byte must be identical in all symbols of a chain.

> ► The value of the parity byte depends on the barcode data for the complete chain. To calculate its value you can use the method *QRCode.StructAppParity()* which is available in the ActiveX interface.
> For more information about the ActiveX interface and its available methods, please refer to the developer manual (see Appendix A).

10.14.6.3 Number of all Symbols [2…16]

Enter the total number of chained QR-Code symbols here. A maximum of 16 symbols may be used within one chain.

10.14.6.4 Index of this Symbol [1…16]

A symbol identification number – which is entered in the index field – must be assigned to each QR-Code symbol. Its value can range from 1 to 16. This index indicates the order in which the data is joined after the reading/scanning process.

10.15 Adjust Properties: Micro QR-Code

The Micro QR-Code is a small variant of the QR-Code with a reduced number of overhead modules and a restricted range of sizes. The maximum amount of data is 35 numeric, 21 alphanumeric, 15 byte, or 9 Kanji characters (in conjunction with the lowest error correction level).

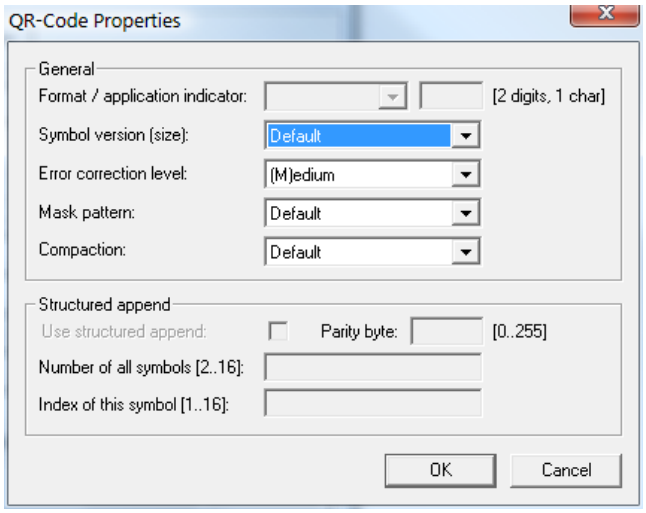


Figure 38: Advanced Properties: Micro QR-Code

10.15.1 Symbol Version (Size)

The Micro QR-Code has four different symbol sizes (M1-M4). The smallest version (=size) M1 is restricted to numeric data and error detection, M2 may contain alphanumeric values, M3 and M4 may use the whole range of the QR-Code character sets (bytes, Kanji).

10.15.2 Error Correction Level

Defines the error correction level – See QR-Code, section 10.14.3.

10.15.3 Mask Pattern

Sets the mask pattern – See QR-Code, section 10.14.4.
Note: The Micro QR-Code has only 4 mask patterns and not 8 like the QR-Code.

10.15.4 Compaction

Defines the compaction mode – See QR-Code, section 10.14.5.

10.16 Adjust Properties: Composite/GS1 DataBar (RSS)

In this menu you can adjust the parameters for the “GS1 Composite Symbology” and for the “GS1 DataBar Expanded Stacked” symbology.

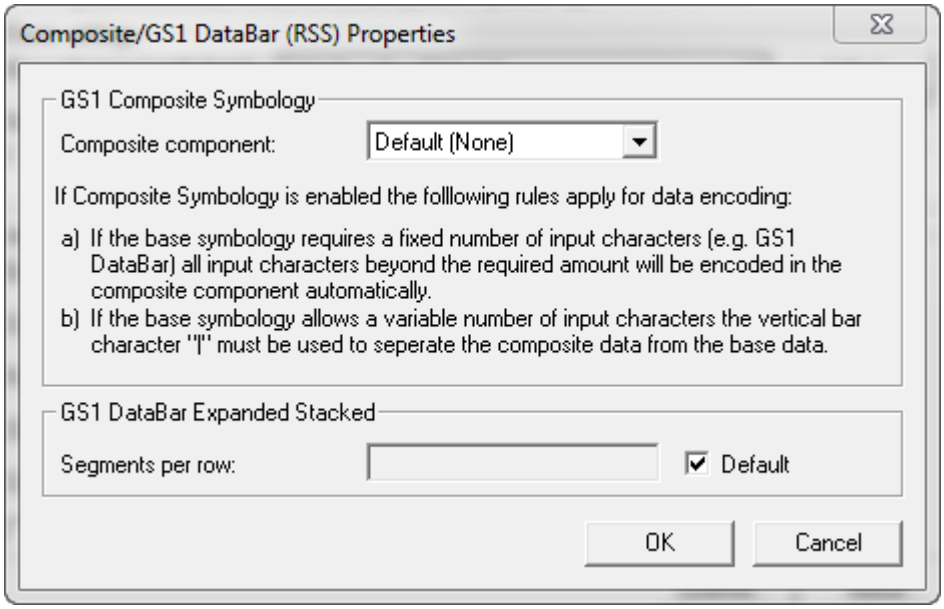

Composite/GS1 DataBar (RSS) Properties
GS1 Composite Symbology
Composite component:
Default (None)
If Composite Symbology is enabled the folllowing rules apply for data encoding:
a) If the base symbology requires a fixed number of input characters (e.g. GS1 DataBar) all input characters beyond the required amount will be encoded in the composite component automatically.
b) If the base symbology allows a variable number of input characters the vertical bar character '|' must be used to seperate the composite data from the base data.
GS1 DataBar Expanded Stacked
Segments per row:
Default
OK
Cancel

Figure 39: Advanced Properties: Composite/GS1 DataBar

10.16.1 Composite Component

Sets the 2D composite component in order to generate an GS1 Composite Symbology.

Value	Description
Default (None)	Composite Symbologies are disabled
Auto (CC-A/B/C)	Automatically choose CC-A, CC-B or CC-C type depending on the length of the input data
CC-A	Use composite component A (CC-A). CC-A is a variant of the MicroPDF417 symbology with a unique combination of row address patterns (RAP). It is the smallest variant of the 2-dimensional composite component. Up to 56 characters can be coded (also alphanumeric) with 3 to 12 rows and 4 columns.
CC-B	Use composite component B (CC-B). CC-B is a subset of the MicroPDF417 Symbol which is identified by the code word 920. CC-B will be chosen automatically when CC-A has not enough capacity (in Auto-mode). CC-B encodes up to 338 Characters (alphanumeric) in 3 to 12 rows and 2 to 4 columns.
CC-C	Use composite component C (CC-C). The CC-C structure is a PDF417 Symbol which is identified by the internal code word 920 (920 is the first code word after the symbol length indicator). The CC-C structure can be used as a 2D composite component of a GS1/UCC/EAN-128 Composite Symbol. It has the largest data capacity among the composite symbologies. It encodes numbers and alphanumeric characters with up to 2361 characters length in 3 to 30 rows. It uses up to 30 data error checking code columns.

Table 22: Composite Component Format

► You can add Composite Components to the following symbologies: EAN-8, EAN-13, UPC-E, UPC-A, GS1 DataBar family and EAN-128. – CC-C is available for GS1/UCC/EAN-128 only!

10.16.1.1 Data Input for the GS1 Composite Symbology

If the composite component is enabled, the data for the 2D composite component has to be separated from the linear component with a vertical bar "|".

Example: 1234567890123|CompositeData

If a symbology has a fixed data length (such as GS1 DataBar) the vertical bar is optional. All remaining characters (after the 14th digit) will be encoded into the 2D component automatically.

10.16.2 Segments per Row

For the GS1 DataBar Expanded Stacked symbology you can adjust the number of data segments per row. Allowed are even values between 2 and 22. This parameter influences the width to height ratio of the barcode symbol.

11 Licensing

11.1 License Types

Please check out http://www.tec-it.com/order for available license types and pricing.

Single licenses are bound to exactly one machine. If you are interested in a single license, please tell us the so-called *"System ID"* of the target computer. You can find the System ID in the licensing dialog (see below).

11.2 Entering your License Data

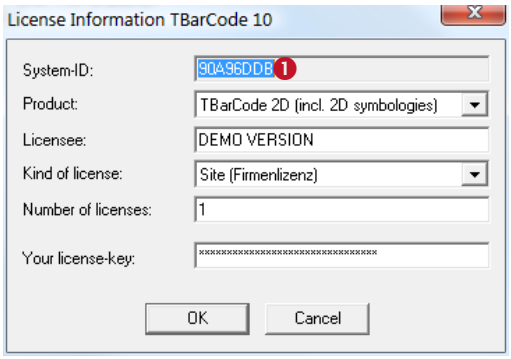
After receiving your license data, enter it in the license dialog. You can also pass the license information via program code (software developers) – see section 8.5.

► Please enter the license data exactly as you received it from TEC-IT!
Spacing and upper/lower case letters are significant. To avoid typographical errors, please insert the data using "copy and paste" from the email containing your license data whenever possible.

11.2.1 License Dialog

For entering the license data right-click on the inserted **TBarCode** object and select *TBarCode-Object ► License* from the pop-up menu.

The following dialog will appear:



❶ This is the *System ID* of your Computer.

Under *"Product"* select the product that you have purchased: You can select:

- TBarCode 1D (standard)
- TBarCode 2D (incl. 2D symbologies).

In the field *"Licensee"* enter the name that you entered as licensee at the time of your purchase (or the name that was assigned to you when you received the license key).

Under *"Kind of License"* select the kind of license that you have purchased. You can select:

- Single (Einzellizenz)
- Site (Firmenlizenz)
- Developer (Entwicklerlizenz).

Under *"Number of Licenses"* enter the number of licenses that you have purchased.

In the field *"Your license-key"* enter the license key exactly as you received it from TEC-IT.

12 Contact and Support Information

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Appendix A: Related Downloads

A.1 Developer Manuals

For software developers **TBarCode** provides additional documents:

- Developer Manuals
  Descriptions on how to use **TBarCode** in development environments (IDEs) like Microsoft Visual Studio, Borland Delphi, Borland C++ Builder, Sybase Power Builder, ASP, .NET and more…
- Developer References
  Detailed descriptions of the **TBarCode** programming interface (API) with all methods, properties, enumerations and events.

These documents are included in the setup (Start Menu: *TEC-IT TBarCode 11* ► *Developer Manuals).*

A.2 Sample Applications

TEC-IT provides a number of sample applications which allow customers to start with the development of their own applications and/or documents as fast as possible.

Sample applications are included in the **TBarCode11** setup (Start Menu: *TEC-IT TBarCode 11* ► *Examples)* or can be downloaded from the TEC-IT web site http://www.tec-it.com (download area).

► Make sure **TBarCode** was installed before trying to run any sample application!

A.3 Barcode Reference

The document “Barcode Reference” provides an overview over supported barcode types and gives additional information on how to use them.

The following issues are discussed:

- Supported Barcode Symbologies
  (with detailed information on each barcode type)
- Check Digits
  (general information and available check digits methods)
- Print Ratio and Ratio Hints (or Ratio Format)
- Format Strings
- Escape Sequences and Control Characters
- Application Identifiers
- MaxiCode and UPS standards
- And more…

The Barcode Reference is available as separate document on the TEC-IT web-site http://www.tec-it.com ► Support ► Knowledge Base.

The direct URL is as follows:

http://www.tec-it.com/download/PDF/Barcode_Reference_EN.pdf.

Appendix B: TBarCode INI-File

For **TBarCode** you can specify an ini-file which allows you to do the following tasks:

- Preset the Draw Mode to “Compatible”
- Apply a Site Lock (OCX only)
- License TBarCode

First create a text file named *barcode.ini* and put the file in the same directory where the files TBarCode.dll and the TBarCode.ocx are located. This is usually one of the **TBarCode** installation directory *C:\Program Files\Common Files\TEC-IT\TBarCode\11.0* or *C:\Program Files\Common Files (x86)\TEC-IT\TBarCode\11.0*. Then edit the ini-file.

> ► Please Note:
> The ini-file is loaded together with the **TBarCode** DLL. All settings which were taken from the ini-file may later be overridden per program code or via the property pages of every single **TBarCode** instance.

B.1 Compatible Draw Mode

In order to use the “Compatible” draw mode as initial setting (draw GDI rectangles instead of the default output method) add the following line to the ini-file:

```
[DRAW MODE]
UseGDIRect=1
```

Possible Options are 1 and 0 (= Compatible draw mode enabled or disabled).

> ► In Word, Excel and other office applications all barcode settings are saved and restored as part of the document files. Therefore the draw mode setting will have no effect when opening an existing document, but only when inserting a new barcode.
> However this setting will change the draw mode setting effectively in **TBarCode** applications like **TBarCode for SAP, TFORMer,** etc.

B.2 Site Lock (OCX only)

The site lock is provided for security reasons. It only applies to the **TBarCode OCX** when it is scripted within Internet Explorer. With this option you can specify, which sites are allowed to execute “critical” function calls on the control and which are not:

```
[DOMAIN_LIST]
Site_Lock=
```

Please refer to the TBarCode OCX Developer Reference (Introduction ► Security) for more information.

B.3 License TBarCode

In order to license TBarCode you can paste your license data in the ini-file. If you want to know how to do this, please contact our support (mailto:barcode@tec-it.com).

Appendix C: FAQ

The frequently asked questions are located on our web page http://www.tec-it.com/FAQ.

If you do not find the required answers, please feel free to contact our support team: mailto:barcode@tec-it.com.